Railway Age Gazette

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE BY THE
SIMMONS-BOARDMAN PUBLISHING COMPANY
WOOLWORTH BUILDING, NEW YORK.

CHICAGO: Transportation Bldg. CLEVELAND: Citizens' Bldg.
LONDON: Queen Anne's Chambers, Westminster.

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Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico..... $5.00
Canada 6.00
Foreign Countries (excepting daily editions)..... 8.00
Single copies .....15 cents each

Engineering and Maintenance of Way Edition and four Maintenance of Way Convention daily issues, North America, $1; foreign, $2.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

WE GUARANTEE, that of this issue 8,850 copies were printed; that of these 8,850 copies, 7,351 were mailed to regular paid subscribers to the weekly edition, 160 were provided for counter and news companies' sales, 1,060 were mailed to advertisers, exchanges and correspondents, and 279 were provided for new subscriptions, samples, copies lost in the mail and office use; that the total copies printed this year to date were 488,150, an average of 9,210 copies a week.

The RAILWAY AGE GAZETTE and all other Simmons-Boardman publications are members of the Audit Bureau of Circulations.

VOLUME 59 DECEMBER 31, 1915 No. 27

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The salient fact in the annual statistical review of the block-signal situation on American railways, published in this issue, is the continued testimony to the superiority of the automatic to the manual block system, as shown in the large investments being made to substitute the one for the other. And the items of proposed new work for 1916 indicate that this tendency grows stronger, year by year. The direct financial results of these changes are, usually, not immediately apparent, but everybody agrees that there is increased safety, and the increase in capacity of road by the shortening of block sections (which always accompanies the introduction of automatics) is surely valuable as soon as that increased capacity is used. The increase in manual block signal mileage is also significant. Well-informed railroad officers have long known that the space interval system is the only adequate preventive of collisions; more and more this belief is shown by actual adoption of the practice. Including Canada, North America now has over 100,000 miles of railway on which the space interval is in use; and the thirty-odd thousand miles of this which covers automatic signals includes a good deal of four-track railway, so that the total miles of track automatically signalled is over fifty thousand.

Progress in Block Signaling

A second very careful estimate has been made by L. F. Loree, president of the Delaware & Hudson, of the volume of railroad securties held abroad. The first estimate which Mr. Loree made was as of March 31, 1915; the second estimate as of July 31, 1915. Between these two dates the par value of railroad securities held abroad decreased by $480,892,135. The total par value as of July 31 was $2,223,510,229. There was apparently returned to this country between the first of February and the last of July securities with a par value almost as great as the amount which France and England borrowed under the terms of the joint loan which was negotiated in this country and floated by the syndicate of bankers with J. P. Morgan & Co. at its head. There is this difference, however, that whereas all of the proceeds of the $500,000,000 loan was to be spent in this country, the proceeds of the sale of railroad securities may or may not have been spent in this country. The total market value of the $2,223,510,229 railroad securities held abroad as of July 31 was $1,751,437,913. It is rather interesting to note the taste of European investors for various classes of railroad securities. Whereas there was $438,415,606 par value of railroad common stock held abroad, its market value was $263,996,929; there was $25,253,201 equipment trust bonds, with a market value, however, of $24,480,411; there was a total of $1,150,339,130 par value of mortgage bonds, with a market value of $962,081,613. In addition to the common stock mentioned above there was $236,151,600 par value preferred stock and $5,608,850 of second preferred stock. The total of all classes of stock held abroad is about 30 per cent of the total par value of railroad securities. The total par value of all stock issued by American railroads reporting to the Interstate Commerce Commission is about 43.50 per cent of the total par value of all securities held by these railroads.

Securities Repurchased from Abroad

The large increase in the number of freight cars ordered in 1915 as compared with 1914 is clearly shown by the car construction statistics on another page. Although the total number is still considerably behind that for 1913, the full significance of the increase as an indication of present business conditions may be realized from the fact that orders for about one-half of all the freight cars ordered during the year were placed after October 1. A year ago attention was drawn to the increase in the number of all-steel box cars ordered. While steel box cars have again shown a large increase, both in the number ordered and in their proportion of the total number of box cars ordered, they cannot yet be said to be coming into general use, since about 95 per cent of the cars of this type were ordered by two systems—the Pennsylvania Lines and the New York Central Lines. The type of construction which has received the widest application during the year is the steel underframe car with steel body framing members. There has been a material increase this year in the average box car capacity. This is accounted for by the increased number of 100,000-lb. capacity cars ordered and the decrease in the orders for 60,000-lb. capacity cars. The number of cars of 80,000-lb. capacity has remained practically unchanged, for the two years, and the orders are widely distributed, making it evident that this is the accepted capacity for general service box

Car Construction in 1915

cars. There is no apparent change in the draft gear situation, friction gears having been specified on about five-eighths of all the freight cars ordered. However, attention should be directed to the fact that while the spring gear has been applied to a large number of cars with capacities as high as 100,000 lb. and 110,000 lb., these cars were practically all ordered by the New York Central Lines, and the tendency toward the adoption of the friction gear is much more general than the figures indicate. Practically the entire number of passenger carrying cars ordered are of all-steel construction. Of a total of about 3,000 cars for all classes of passenger train service approximately 90 per cent are all-steel. The others are of steel or composite underframe construction and are nearly all for express refrigerator or milk service. As compared with over 200 cars of wood construction reported a year ago it is interesting to note that, out of a considerably larger total, practically no orders for passenger cars of wood construction have been reported this year.

A NEW LOW RECORD IN RAILWAY EXPANSION AND ITS MEANING

THE statistics regarding developments in the railway field in the year 1915 which have been compiled by the *Railway Age Gazette,* and are published in this issue, disclose a most remarkable and significant fact. This is, that the new mileage of railways built in this country this year is less than in any other year for over 50 years, or since 1864. Furthermore, there have been only three years since 1848 when the increase in mileage was so small.

Neither the statistics which have been compiled by the *Railway Age Gazette* since 1893, nor those which have been compiled by the Interstate Commerce Commission since 1887 extend far enough back to afford a precedent for the conditions which have prevailed in 1915. The statistics of Poor's Manual of Railroads, which go back to 1833, cover for calendar years, not the new mileage built, but the increase in operated mileage. The two things are not the same; for a railway line built in one year may not be put into operation until the next. However, bearing this fact in mind, Poor's statistics may be used for comparison. They show that the only years since 1848 when the increase in operated mileage was less than 1,000 miles were 1861, 1862 and 1864; and the new mileage built in 1915 was less than this amount. In other words, the only period within the last 66 years which is comparable with 1915 in respect to new mileage built, is that during which the nation was devoting its energy and resources, not to its economic and industrial development, but to the prosecution of the greatest war in history until the present one in Europe.

The showing made by these figures is rendered more impressive if they be considered in connection with the fact that in October, 1915, there was the greatest mileage of railways in the hands of receivers in the United States ever recorded. This is not the case at the end of the year, only because since then the receivership of one large road, the Wabash, has been terminated. The number of cars and locomotives bought in 1915 was greater than in 1914; but it was smaller than in any other years except 1908 and 1914 since we began compiling statistics on this subject.

The question at once arises as to why the development of the railways sank to such a low ebb in 1915. Why did railway construction become less than in any year of the profound depression following the panic of 1873? Why was it more nearly halted than in any of the years of business prostration following the panic of 1893? Why did it require the ravages of civil war to create a condition comparable to that existing in 1915? The extreme situation which has existed is not attributable to general business depression, for the general depression has not been as profound as it was in the 70's or the 90's. It is not attributable to the war in Europe, for the decline in railway building began long before the war.

It is evident that the condition in the railway field in the year now closing has been largely due to causes which did not operate in the past, or which have operated recently with unprecedented force. Furthermore, what those causes are must be clear to every person who has studied railway affairs and the railway situation with a real desire to understand them. The outgo of the roads has been increased enormously by advances in wages and taxes, and by regulation by the state and national governments; and their total earnings have been restricted by regulation of their rates by the state and national governments. Ground between these upper and nether millstones the income available for interest and dividends has tended downward for over nine years. It has not become relatively as small as in some earlier periods; but in those periods the roads were not subjected, as they are now, to regulation, one of the main avowed purposes of which is to restrict their net return. In consequence, in those earlier periods capitalists and railway managers were encouraged to continue to make investments in permanent improvements and in new lines by the hope and expectation that after the depressions had passed they would be able to make large profits which would more than offset the losses incurred in bad times. The present system of regulation has effectually discouraged such hopes and expectations. This, unquestionably, is the correct explanation of the condition in the railway field disclosed by our statistics for 1915.

There are many gentlemen of the railway-baiting type, such as Senator La Follette, Senator Cummins and Clifford Thorne, who in reply to such statements as the foregoing pile up long rows of figures to show that under regulation the railways have been, and are, eminently prosperous, and that therefore regulation is not responsible for the interruption of railway development, and consequently should not be made less drastic. It is usually easy to demolish their statistics and the conclusions they draw from them, but the situation which actually exists is the best answer to them. It demonstrates beyond question that capitalists are not disposed to invest in railways. They must, therefore, believe that such investment would be unprofitable. Those who have shown that they know how to make money by making it must be better judges of the relative profitableness of investment in the various fields than even the most eminent statesmen of the class mentioned. Anyway, their opinion, and not that of the railway-busting politicians, is controlling it, for they have the capital and will invest it where they please; and the facts show that at present they do not please to invest it in railways.

It may be said that the reason why the construction of new mileage has been so greatly reduced is that the country now has all the railways it needs. Possibly it does not need many more trunk lines, but it certainly is not true that it does not need a much larger mileage. There are vast areas susceptible of being rendered highly populous and productive scattered throughout the country, but mainly in the south, the southwest and the southeast, which can never be adequately developed without the construction of a large additional mileage of railways. In New Jersey, Massachusetts, Pennsylvania, Ohio, Illinois, Indiana and Connecticut, and in the District of Columbia, the mileage of railway line per 100 square miles exceeds 20 miles, and rises to 31 miles in New Jersey and to over 60 miles in the District of Columbia. But the average number of miles of railway per 100 square miles of territory in the entire United States is only 8½ miles. In Wyoming, Utah, New Mexico, Nevada and Arizona it is less than 3 miles; in Idaho, Montana and Oregon, only a little more than 3 miles; in Texas only 6 miles; and in California, Colorado and South Dakota less than 6. In Nebraska it is only 8 miles and in Washington and North Dakota it is less than 8. In Tennessee, Oklahoma, Kentucky and Florida it is less than 10 miles. In 20 states the mileage of railway per 100 square miles of area is less than 10 miles, and in 6 others it is less than 12 miles. Are the people of these states prepared to say that they do not want any more branch lines built? Do the people of Texas, with only 6 miles of railway per 100 square miles, want no more lines? In all the great territory west of the western boundary of Minnesota, Iowa,

Missouri, Arkansas and Louisiana, there are only four states whose mileage of railway per 100 square miles equals the average for the entire United States, 8½ miles, and there are only two west of the Mississippi river which have more than 11 miles per 100 square miles. And yet it is in this relatively undeveloped section that regulation has waxed most furious.

The condition in the railway field is not good for capital, because capital is not getting a fair return. It is not good for labor, because, while labor is getting high wages, the interruption of railway expansion is preventing a normal increase in the number of men employed in transportation services. It is not good for the public, because it is interfering with the development of the country in every way.

Is the present condition as respects railway development going to continue? While the statistics for 1915 do not show it, the situation undoubtedly is changing for the better. We do not refer to the large increases in gross and net earnings which occurred during the last six months of the year. Large, important, and helpful as these were, they would have little significance if there were reason to believe that the same influences which have been affecting the railways were going to continue to affect them with the same force as in the past. Increases in expenses and taxes unaccompanied by advance in rates have converted large increases in gross earnings to decreases in net earnings in the past, and could and would do so in future. The true and sufficient reason for optimism is that the press, the public and influential public men, including members of the Interstate Commerce Commission and the President of the United States, are beginning to realize the condition existing in the railway field, and to adopt means for dealing with it. The press is discussing it with a fairness and intelligence never shown before. The Interstate Commerce Commission, while refusing many advances in rates which the railroads have sought, has granted many which, combined, will amount to a good many millions of dollars a year. It is also advocating its own reorganization along lines which it believes would increase its efficiency, and is apparently disposed to curb some of the pernicious activities of the state regulating authorities. The attitude of some of the state regulating bodies themselves is improving. Finally, and perhaps most important of all, President Wilson has recommended the creation of a commission to investigate the entire subject of the regulation of railways and to recommend such changes in the present system and policy as the welfare of the nation demands. That a commission composed of able economists, business men and statesmen would find reason for recommending great and important changes in the present system and policy there can be no serious question.

The country has been experimenting with effective regulation for almost 10 years. Experience has shown that effectiveness is not the only thing or the most important thing needed. The main things needed are consistency, expertness, fairness, public spirit, and wisdom both in drafting and in administering the regulatory laws. The whole system and policy of regulation ought to be overhauled and made more simple and constructive. The inconsistencies and conflicts between state and federal regulation should be abolished. The principle should be adopted of not only restricting the freedom of action of the management of railways in respects in which restriction will promote the welfare of the public, but of also helping them in those respects in which helping them will be of public benefit. If the labor brotherhoods, as well as the railway managements, need curbing, then both, and not merely one, should be curbed. If railway profits are to be regulated, they should be regulated, not merely to prevent them from becoming too large, but also to prevent them from becoming too small.

There are many indications that the press, the business interests and leading public men are being brought by the compulsion of the irrefutable logic of events to a recognition of the soundness of these principles, and that they will join and join soon in a movement to give them effect in our policy of railway regulation.

LOCOMOTIVE PROGRESS IN 1915

THERE were ordered during the calendar year 1915, 1,573 locomotives, an increase of 308 over the figures for 1914. Of these, practically 50 per cent were ordered since October 1 and the outlook for a continuation of this rate of ordering in 1916 is promising. Of those ordered the greater number were Mikados, there being 562 of this type, a considerable increase over 1914. The number of Mallets ordered has also increased, there being 59 in 1914 as against 120 ordered in 1915. The 75 locomotives of the Santa Fe type ordered constitute an increase of 12 over those for 1914, and it is worthy of note that this type has come into popularity during the past two years, none having been ordered in 1911, 1912 and 1913. There was a slight falling off in the number of Mountain type locomotives, but the number ordered in any year indicates that this type is still favored for special service only. There were 10 more electric locomotives ordered in 1915 than in 1914.

Of the total locomotives ordered, 1,174 are equipped with superheaters and 919 with brick arches. The percentage in both these cases show no falling off but rather a tendency toward an increase. There has been no tendency toward the revival of compounding, practically the only type in which it is employed being the Mallet.

Last year we called attention to the probability of large numbers of existing locomotives being equipped with economy and capacity increasing devices. It is interesting to note that during the past year there were practically two locomotives modernized in this way for every new locomotive built. Attention was also called at that time to the experimental use on one locomotive of pulverized fuel. The experimental work in this connection proved successful and the work of development along these lines has continued throughout the year, there now being three locomotives so equipped. The results from those now in service give indications of the more extended use of this fuel in the immediate future.

The continued increase in locomotive capacity is well shown by the marked increase in the number of stoker-fired locomotives. There are now about 1,300 locomotives in the United States on which the mechanical stoker is in daily use and the greater portion of these are of such a maximum capacity as to be beyond the limits of hand firing. The records of stoker-fired locomotives show marked increases in the tonnage rating as compared with the same or similar locomotives hand-fired. Of superheating it may be said that while there have been no radical changes during the past year there has been, and in all probability will continue to be, a tendency toward the use of a greater number of units, giving an increase in the amount of superheat obtained. The only radical move made in connection with the fire-brick arch is the extension of its use, supported on arch-tubes, to oil-burning locomotives. It now has a fair start in this field and promises excellent results.

A year ago the use of special steels and refined designing in order to obtain the lightest possible reciprocating and running parts was confined to but a few roads. There has been a great deal more attention given to this during the past year, resulting in a considerable number of locomotives having been built with what might be considered a minimum weight in the parts comprising the driving gear and a corresponding increase in the dimensions of the boiler to provide additional steaming capacity.

There has been, as previously noted, a considerable increase in the popularity of the ten-coupled locomotive and there are now in service several locomotives of this type having all the driving wheels flanged and working successfully on curves of 20 degrees because of the application of a floating front axle and ball joints in the side rods. Locomotives with this construction now in service on the New York, Ontario & Western have 28-in. by 32-in. cylinders, 57-in. driving wheels and a maximum tractive effort of 71,200 lb., the driving wheel base being 20 ft., while similar locomotives for the Erie Railroad have 31-in. by 32-in. cylinders, 63-in. driving wheels and develop 83,000 lb. tractive effort on a driving wheel base of 22 ft. 6 in. It has been pre-

dicted that the use of this principle on a twelve-coupled locomotive with floating driving axles front and back can readily provide a tractive effort of 100,000 lb. with the use of a single pair of cylinders, the limit of wheel loads now used on a number of locomotives not being exceeded.

The largest and most powerful locomotives of the Pacific type built during 1915 of which we have record are those of the Delaware, Lackawanna & Western, which develop a tractive effort of 47,500 lb., and have a total weight of 305,500 lb., cylinders 27 in. by 28 in., and driving wheels 73 in. in diameter. They were built by the American Locomotive Company. Locomotives of this type built by the Baldwin Locomotive Works for the Richmond, Fredericksburg & Potomac develop practically the same tractive effort, but have driving wheels 68 in. in diameter. The cylinders of these locomotives are 26 in. by 28 in. and the total weight 293,000 lb. The most powerful locomotive of the Mallet type ordered during the year of which we have record develops 91,400 lb. maximum tractive effort, but more powerful Mallets have been built in previous years. A Mikado type locomotive built for the Montour Railroad develops 64,500 lb. tractive effort. The most powerful locomotive of the 2-10-2 type is that the Erie Railroad, referred to above.

The Erie Railroad has under construction at the Baldwin Locomotive Works two Triplex locomotives similar to the one which was built in 1914. In general the construction is the same as that of the original locomotive, although, as might be expected, certain changes were made in details based on the performance of the experimental locomotive. Everything considered, while the building of large locomotives continues, there is not the tendency that there was a few years ago to build large engines without due consideration being given to economical features as well as maximum capacity. On the contrary the immediate future will probably see continued progress along these lines.

RECEIVERSHIPS AND FORECLOSURE SALES

At one time during the past year there was approximately 42,000 miles of railroad being operated by receivers. Since that time the Wabash, operating 2,514 miles, has been sold and taken over by a new company. There have been various other adjustments and changes, so that the mileage being operated by receivers on December 31 was 38,661. The total face value of securities of the old companies of the roads in receivers' hands was $2,354,900,301. The accompanying table shows also the amount of receivers' certificates and the aggregate of interest in default wherever this information could be obtained. On December 27 an application was made in Texas for the appointment of a receiver for the Texas & Pacific. The hearing on this application was set for December 31. The road is, of course, not included in our table. As will be seen from the accompanying table, there were 12 roads for which receivers were appointed during the calendar year 1915. The total mileage for these 12 roads was 20,143, and the total face value of the securities $1,070,808,628.

FORECLOSURE SALES IN 1915

Name of Company.	Mileage.	Funded Debt Outstanding.	Stock Outstanding.
Arkansas, Louisiana & Gulf	62	$1,230,000	$1,231,000
Atlantic Northern	17	100,000	150,000
Buffalo & Susquehanna	91	6,162,000	10,000,000
Cincinnati, Indianapolis & Western	381	7,115,800	7,124,754
Fitzgerald, Ocilla & Broxton†	14	150,000	300,000
New Orleans, Mobile & Chicago	403	14,152,602	10,075,300
New Orleans, Texas & Mexico	286	30,179,409	2,000,000
Ocala Northern	53	*	*
Opelousas, Gulf & Northeastern	57	1,143,000	1,422,250
Wabash	2,515	99,272,240	92,400,427
Williamsville, Greenville & St. Louis	35	525,000	525,000
Total	3,914	$160,030,051	$125,228,731

*The amount of outstanding securities of this road is not ascertainable.
†This road was sold under foreclosure and later the operation of it was discontinued.

The most important roads that went into bankruptcy in 1915 were the Chicago, Rock Island & Pacific, the Missouri Pacific, the Missouri, Kansas & Texas and the Western Pacific. The Rock Island holding company device has been described at length in these columns. The whole scheme hung on the ability of the railway company to pay dividends. This it could not do in 1914 and the holding companies were wiped out, but the railway company's credit had been so impaired that it could not make arrangements for refunding maturing obligations and was also put into the hands of a receiver in 1915.

SUMMARY OF RECEIVERSHIPS FOR 40 YEARS

Year.	No. of roads.	Miles.	Bonds and stocks.
1876	42	6,662	$467,000,000
1877	38	3,637	220,294,000
1878	27	2,320	92,385,000
1879	12	1,102	39,367,000
1880	13	885	140,265,000
1881	5	110	3,742,000
1882	12	912	39,074,000
1883	11	1,990	108,470,000
1884	37	11,038	714,755,000
1885	44	8,836	385,460,000
1886	13	1,799	70,346,000
1887	9	1,046	90,318,000
1888	22	3,270	186,814,000
1889	22	3,803	99,664,000
1890	26	2,963	105,007,000
1891	26	2,159	84,479,000
1892	36	10,508	357,692,000
1893	74	29,340	1,781,046,000
1894	38	7,025	395,791,000
1895	31	4,089	369,075,000
1896	34	5,441	275,597,000
1897	18	1,537	92,909,000
1898	18	2,069	138,701,000
1899	10	1,019	52,285,000
1900	16	1,165	78,234,000
1901	4	73	1,627,000
1902	5	278	5,835,000
1903	9	229	18,823,000
1904	8	744	36,069,000
1905	10	3,593	176,321,000
1906	6	204	55,042,000
1907	7	317	13,585,000
1908	24	8,009	596,359,000
1909	5	859	78,095,000
1910	7	735	51,427,500
1911	5	2,606	210,606,882
1912	13	3,784	182,112,497
1913	17	9,020	477,780,820
1914	22	4,222	199,571,446
1915	12	20,143	1,070,808,628

The Missouri Pacific was one of the Gould roads. It was much overcapitalized, its credit having been used for financing other Gould railway projects, and control of the company was secured by Kuhn, Loeb & Co., of New York. This strong banking house proposed a reorganization plan under which all classes of security holders would have accepted certain readjustments and the holders of junior bonds and the bonds on what were considered unimportant lines would have accepted a

SUMMARY OF FORECLOSURE SALES IN 40 YEARS

Year.	No. of roads.	Miles.	Bonds and stocks.
1876	30	3,840	$217,848,000
1877	54	3,875	198,984,000
1878	48	3,906	311,631,000
1879	65	4,909	243,288,000
1880	31	3,775	263,882,000
1881	29	2,617	137,923,000
1882	16	867	65,426,000
1883	18	1,354	47,100,000
1884	15	710	23,504,000
1885	22	3,156	278,394,000
1886	45	7,687	374,109,000
1887	31	5,478	328,181,000
1888	19	1,596	64,555,000
1889	25	2,930	137,815,000
1890	29	3,825	182,495,000
1891	21	3,223	169,069,000
1892	28	1,922	95,898,000
1893	25	1,613	79,924,000
1894	42	5,643	318,999,000
1895	52	12,831	761,791,000
1896	58	13,730	1,150,377,000
1897	42	6,675	517,680,000
1898	47	6,054	252,910,000
1899	32	4,294	267,534,000
1900	24	3,477	190,374,000
1901	17	1,139	85,808,000
1902	20	693	39,788,000
1903	13	555	15,885,000
1904	13	524	28,266,000
1905	6	679	20,307,000
1906	8	262	10,400,000
1907	6	114	13,777,000
1908	3	138	2,547,000
1909	12	2,629	250,033,000
1910	17	1,100	93,660,109
1911	13	1,386	40,741,453
1912	12	661	25,910,990
1913	6	1,159	86,163,850
1914	9	1,470	83,189,500
1915	11	3,914	285,258,782

nominal scaling down of the face value of their securities and accepted a preferred stock in place of a bond. Common stockholders were asked to subscribe sufficient money to rehabilitate the property. It was soon found, however, that it was quite impossible to reconcile the various conflicting interests of security holders and that the only way to effect a reorganization would be through receivership. The road, therefore, was put into the hands of receivers.

The Missouri, Kansas & Texas was being particularly well operated. Crop failures and flood damage had been very costly

RECEIVERSHIPS AND FORECLOSURES

Name of Road	Mileage	Date of Receivership	Bonds of Old Co.	Stock of Old Co.	Total Old Co. Securities	Receivership Ctfs.	Interest in Default
Alabama, Tennessee & Northern	194	Nov. 1915	$5,297,000	$25,000,000	$30,297,000	.....	.....
Apalachicola Northern	102	May 28, 1914	2,000,000	3,000,000	5,000,000	$10,000	None
[1]Arkansas, Louisiana & Gulf Ry.	...	May 29, 1913	.....	.....	.....	.....	.....
[1]Arkansas South Eastern	...		.....	.....	.....	.....	.....
Atlanta, Birmingham & Atlantic	638	Jan. 1, 1909	19,172,407	35,000,000	54,172,407	4,994,000	$4,969,392
Beaumont, Sour Lake & Western	119	July 9, 1913	2,057,825	85,000	2,142,825	222,000	316,940
Birmingham, Columbus & St. Andrews	38		[3]25,000	[3]4,500,000	[3]4,525,000	3,635	[8].....
Boca & Loyalton	54		418.000	1,200,000	1,618,000	.....	.....
Boyne City, Gaylord & Alpena	70	Oct. 1914	310,000	501,200	811,200	20,000	.....
[4]Brownwood, North & South	18	July 5, 1913	91,000	225,000	316,000	.....	.....
[5]Buffalo & Susquehanna Ry.	90	May 2, 1910	6,873,750	10,000,000	16,873,750	None	.....
Cape Girardeau Northern	106	April 14, 1914	1,500,000	110,000	1,610,000	93,700	148,055
Chicago & Eastern Illinois	1,282	May 27, 1913	63,155,000	25,817,800	88,972,800	6,000,000	2,262,096
Chicago, Anamosa & Northern	36		.....	[3]400,000	400,000	.....	.....
Chicago, Peoria & St. Louis	255	July 31, 1914	5,506,000	4,000,000	9,506,000	.....	.....
Chicago, Rock Island & Pacific	8,330	April 20, 1915	267,142,789	74,482,523	341,625,312	2,500,000	[6].....
Cincinnati, Bluffton & Chicago	52	March 13, 1908	1,500,000	1,125,000	2,625,000	179,052	[7]900,000
Cincinnati, Hamilton & Dayton	1,003	July 2, 1914	49,607,000	8,248,175	57,855,175	None	4,308,850
Colorado Midland	338	Dec. 13, 1912	9,469,000	7,476,100	16,945,100	None	1,136,280
Columbus & Southern	23	Oct. 19, 1914	[3]500,000	2,000,000	2,500,000	.....	.....
Crooked Creek Railroad & Coal Co.	18	Jan. 1, 1915	116,500	112,500	229,000	None	5,825
Dansville & Mt. Morris	12	June, 1894	[3]150,000	[3]50,000	200,000	.....	.....
Denver, Laramie & Northwestern	57	June 12, 1912	1,071,546	25,660,900	26,732,446	74,698	220,322
Florida, Alabama & Gulf	26	Feb. 27, 1914	500,000	150,000	650,000	None	105,000
[8]Florida Central	47	June 1, 1912	.....	.....	.....	.....	.....
Florida Railway	59	June 25, 1915	[3]1,180,000	4,000,000	5,180,000	.....	.....
Ft. Smith & Western	250	Oct. 9, 1915	[3]5,833,000	[3]5,000,000	10,833,000	None	.....
Ft. Worth & Rio Grande	235	July 5, 1913	4,467,000	2,928,300	7,395,300	None	.....
Georgia & Florida	320	April, 1915	8,308,454	8,750,000	17,058,454	125,000	561,065
Gould Southwestern	18	April, 14, 1914	.....	[3]51,000	51,000	[3]7,500	.....
Houston & Brazos Valley	28	Nov., 1915	420,000	24,000	444,000	.....	.....
Idaho Southern	24	Dec., 1915	[3]1,141,000	[3]3,000,000	4,141,000	.....	.....
International & Gt. Northern	1,160	Aug. 11, 1914	38,229,500	4,822,000	43,051,500	600,000	831,217
Iowa & Omaha Short Line	12	July 10, 1913	[3]150,000	.....	150,000	.....	.....
Kansas City & Memphis	56	July, 1914	855,516	852,000	1,707,516	80,658	34,400
Liberty White	49	Nov., 1914	[3]250,000	[3]300,000	550,000	.....	.....
Louisiana & North West	121	Aug. 23, 1913	1,264,619	2,300,000	3,564,619	None	.....
Macon & Birmingham	97	Feb. 1, 1908	500,000	500,000	1,000,000	12,000	.....
Marietta, Columbus & Cleveland	46	July 10, 1914	250,000	250,000	500,000	.....	.....
Mississippi, Hill City & Western	18		.....	.....	.....	.....	.....
Missouri & North Arkansas	365	April 1, 1912	8,340,000	8,340,000	16,680,000	2,062,750	166,800
Missouri, Kansas & Texas	3,536	Oct., 1915	146,455,450	76,283,257	222,738,707	None	None
Missouri, Oklahoma & Gulf	328	Dec. 11, 1913	[9]$8,774,000 [9]10,655,200	[9]8,474,000	27,903,200	.....	.....
[10]Missouri Pacific	3,931	July, 1915	161,118,500	82,841,085	243,959,585	None	1,849,625
[10]St. Louis, Iron Mountain & Southern	3,363	July, 1915	144,331,120	44,394,739	188,725,859	None	757,450
Muscatine, North & South	55	Sept. 16, 1914	800,000	425,000	1,225,000	None	30,000
[12]Nashville & Knoxville	...		.....	.....	.....	.....	.....
New Berlin & Winfield	8		[3]33,800	[3]30,000	63,800	.....	.....
New Orleans, Mobile & Chicago	402	Dec. 19, 1913	13,686,920	9,333,250	23,020,170	None	2,031,231
New Orleans, Texas & Mexico	287	July 5, 1913	30,470,492	2,000,000	32,470,492	.....	.....
Ohio & Kentucky	40		.....	.....	.....	.....	.....
Ohio River & Columbus	24	Oct. 8, 1914	500,000	501,000	1,001,000	3,750	54,408
Orange & Northwestern	62	July 9, 1913	1,066,947	35,000	1,101,947	None	165,377
Pacific & Idaho Northern	90	Sept. 4, 1915	2,646,911	2,929,800	5,576,711	None	520,263
Pere Marquette	1,795	April 5, 1912	66,672,000	26,268,410	92,940,410	.....	.....
Pittsburgh, Lisbon & Western	34		1,210,995	5,000,000	6,210,995	.....	.....
Pittsburg, Shawmut & Northern	184	Aug. 1, 1905	14,491,600	15,000,000	29,491,600	3,100,000	5,796,640
Rome & Northern	20	Feb. 28, 1911	[11]300,000	.....	300,000	17,500	.....
St. Louis & San Francisco	4,749	May 27, 1913	287,310,928	49,985,762	337,296,690	3,000,000	10,701,919
St. Louis, Brownsville & Mexico	518	July 5, 1913	12,179,506	500,000	12,679,506	.....	.....
St. Louis, San Francisco & Texas	244	July, 1913	1,188,000	804,000	1,992,000	.....	.....
San Antonio, Fredericksburg & Northern	26	Oct. 28, 1914	.....	30,000	30,000	.....	.....
San Antonio, Uvalde & Gulf	316	Aug., 1914	4,413,000	280,000	4,693,000	.....	.....
Sharpsville Railroad	21	Jan. 20, 1897	.....	350,000	350,000	None	76,110
[13]Tennessee Central	294	Dec. 31, 1912	12,220,900	8,000,000	20,220,900	425,899	2,952,695
Tennessee Railway	59	July 1, 1913	1,135,000	.....	1,135,000	131,000	231,000
Toledo, St. Louis & Western	451	Oct. 23, 1914	28,027,000	19,947,600	47,974,600	.....	.....
Trinity & Brazos Valley	303	June 16, 1914	.....	.....	.....	.....	.....
Valdosta, Moultrie & Western	42	Aug. 23, 1913	300,000	100,000	400,000	.....	.....
Virginia & Kentucky	5	Jan. 1, 1914	.....	.....	.....	.....	.....
Wabash, Chester & Western	65	July 15, 1914	690,000	1,250,000	1,940,000	.....	470,536
[13]Wabash-Pittsburgh Terminal	63	May 29, 1908	50,236,000	10,000,000	60,236,000	.....	.....
Western Pacific	945		75,000,000	75,000,000	150,000,000	None	1,250,000
Wheeling & Lake Erie	512	June 8, 1908	24,329,325	36,980,400	61,309,725	.....	8,183,850
[14]Wisconsin & Michigan	123	Jan. 15, 1912	.....	.....	.....	.....	.....
Total	38,661		$1,607,895,500	$747,004,801	$2,354,900,301		

[1]On September 15, 1915, this road was sold under foreclosure, but it was under lease to the Arkansas, Louisiana & Gulf Railroad to December 1, 1915. As soon after that date as is practicable the new purchaser is to take over the road. The mileage is not included in the totals, nor are the securities.

[2]This road, 31 miles long, has been in the hands of receivers for a number of years. Operations have now been discontinued and the mileage and securities are not, therefore, included in the totals.

[3]No recent figures for the securities of the old company are available. The figures used here are those given in Poor's Manual or other unofficial sources.

[4]This is one of the former subsidiaries of the St. Louis & San Francisco but is now being operated by a separate receiver. Its mileage and operations however, were formerly included in the annual reports of the old St. Louis & San Francisco company.

[5]This road was sold under foreclosure in October, 1915, but the receiver was instructed to continue the operation of the road until the delivery of the deed, the purchaser for the bondholders not having taken delivery up to the latest advices received pending negotiations for the disposition of the property to other parties.

[6]The amount of interest in default is not ascertainable because of the periods of grace for various bonds on which interest was not paid when due, but has not become as yet legally in default.

[7]No interest has ever been paid on the outstanding bonds.

[8]The portion of this road in Florida was sold to the Atlantic Coast Line and that portion in Georgia has now been abandoned and the rails taken up and sold as scrap. No mileage or securities, therefore, are included in the totals.

[9]The $8,774,000 bonds and the stock and receivers' certificates do not include securities of the railroad company or the Texas company. The railroad company's bonds are shown separately.

[10]The securities of these two companies are furnished separately. There is, therefore, presumably some duplication in the amount shown as outstanding.

[11]This is the amount given as the cost of road.

[12]The Tennessee Central figures include securities and mileage of the Nashville & Knoxville.

[13]Including West Side Belt.

[14]Information refused.

in the previous year, but had there been a normal condition in the railway security market the company ought easily to have pulled through its difficulties. It had $11,000,000 notes falling due shortly before the sinking of the Lusitania. An agreement with the holders of these notes was reached by which all but a very small minority of the notes were extended. After the sinking of the Lusitania, however, bankers were more than ever disinclined to make any new ventures, and further flood damage necessitated considerable immediate expenditures of cash on the Missouri, Kansas & Texas. This situation was made worse by attempts on the part of the holders of the notes that were not extended to compel payment in cash, and it was decided that the best way to preserve the interests of everybody was to place the roads in the hands of a receiver.

The Western Pacific was the extension of the Gould system to the Pacific coast, which had previously ended at the western extremity of the Denver & Rio Grande at Salt Lake City, Utah. The road had no local traffic to speak of and was carried for a while by the Denver & Rio Grande, but receivership had been inevitable for some time.

BRIDGE CONSTRUCTION IN 1915

THE unprecedented stagnation in railroad development during the past year is reflected in the field of bridge building. The tonnage of structural steel bridges erected during the year has been unusually small and except for the sudden and unusual demand late in the year for structural steel as an indirect result of the war orders, the bridge shops would have fared badly. The general reduction in railroad construction and retrenchment in the replacement of existing structures has naturally resulted in a marked reduction in the construction of railroad bridges of moderate size. There has been an unusual number of large bridges under construction during the year, but this is readily explained by the fact that work had been commenced on most of these structures before the present depression became general. The year 1915 saw work in progress on bridges over the Ohio river at Metropolis, Ill., Sciotoville, Ohio, and Pittsburgh, Pa., and over the Mississippi river at St. Paul, Keokuk and Memphis, while the citizens of St. Louis are finally building the $2,000,000 approach to their free bridge. A new project of importance started during 1915 is a bridge over the Missouri river at Kansas City for the Chicago, Burlington & Quincy.

The crowning achievement of the year was the closing of the Hell Gate arch, but the year was marked also by another important event in the cempletion of the Lackawanna's Tunkhannock viaduct, a triumph for concrete construction. Satisfactory progress is being made on the Quebec bridge, but the honor of witnessing its completion belongs to another year.

Still other structures deserve notice as marking progress in bridge engineering. The bridge which is being built jointly by the Burlington and the Nashville, Chattanooga & St. Louis at Metropolis, Ill., provides for a pin-connected, simple truss span of 725 ft., the longest of its kind in the world. The new bridge of the Pennsylvania Lines at Pittsburgh contains a riveted truss simple span of 525 ft., also the longest of its type in the world. At Sciotoville the piers for the Chesapeake & Ohio Northern bridge are now ready for the erection of the longest riveted trusses in America. In railroad plate girder construction, records have been set by the Nickel Plate on track elevation work in Chicago, where girders have been used for a 130-ft. 6½-in. simple span, and again by the Canadian Pacific at Montreal for a double track draw span involving deck girders 239 ft. long and 13½ ft. deep.

One trend of bridge construction is noted in the increased use of special steels, no less than five of the structures mentioned above involving the use of high strength steel in some parts. However, the tonnage of this material represents so small a proportion of the total tonnage of bridge shops that its fabrication is still considered of a highly special nature. Further developments have been noted in the design of movable bridges, particularly of the vertical lift type. Similarly in erection there has been a continued display of ingenuity and skill on the part of those responsible. In this field of engineering no single incident deserves more notice than the work on the Hell Gate arch.

CONSTRUCTION ACTIVITIES IN 1915

NO statistics show in a more striking manner the depression through which the railways have been passing during the past year than those of the mileage of new lines completed. Following four years of steadily declining activity in this field and particularly last year, when the amount of new line placed in service was only half of that built in the previous year, a further reduction of 35 per cent this year is most unusual and significant. Records compiled in these columns for the past 23 years show no equal for this condition. It is necessary to go back to 1864 during the midst of the Civil War to find a year in which less miles of new railway were built than in 1915, or a year in which less than 1,000 miles of line was placed in service. Instead of a normal increase in the mileage of about 1½ per cent, the increase this year was only about 0.35 per cent, or less than that for any year since railway development really began in this country. It must also be remembered that some of the mileage placed in service this year and reported in the statistics for 1915 was placed under construction three or four years ago. This was the case of the Lackawanna cut-off north of Scranton, Pa., which was started in 1912. Even less mileage was placed under construction during 1915 than these figures indicate.

The distribution of this mileage through the country is also interesting. A total of 172 miles was built in the area east of the Mississippi and north of the Ohio rivers. Eliminating the 98 miles built in Pennsylvnia and the 29 miles built in Wisconsin, only 45 miles was built in the remaining 14 states. The south shows continued although decreased activity, 253 miles being built in 11 states. Likewise, in the west, a total of 473 miles was built. While there is the greatest demand for increased railway facilities in the south and west, it is interesting to note that the state in which the largest mileage of new line was built during 1915 was Pennsylvania. While few if any long lines will be built in the more highly developed eastern states which are now well served with railway facilities, increased development will require the construction of additional mileage of short lines continuously for many years.

In studying statistics of railway construction and particularly such unusual data as are compiled this year, it is interesting to observe the extent to which construction activity was curtailed in those southwestern states which have been most active in anti-railroad legislation, including particularly Iowa, Missouri, Kansas, Arkansas, Oklahoma and Texas. In one of these states, Iowa, no mileage was built during 1915, while only 0.16 miles was built in Missouri. In Texas, the state which has led in attacks on the railways and which probably needs additional railway facilities more than any other state in the Union, only 4.40 miles was built in 1915, as compared with 50 miles in 1914 and 356 miles in 1913. Only 35 miles of line was built in Oklahoma, while 59 miles was built in Kansas, this latter mileage consisting principally of three short independent lines.

The mileage of second and other multiple main tracks built last year is also correspondingly small, reflecting not only the unsatisfactory conditions under which the railways have been operating, but particularly the decreased demands upon the railways for additional facilities. Following the congestion of business in 1906 and 1907, the railways spent large sums for enlarged terminals and multiple main tracks, with the result that in general, they are to-day in a position to handle economically and promptly considerably more business than was offered to them during 1915.

The situation in Canada is also interesting. As was to be expected, the beginning of the European war brought about an almost complete cessation of construction activities of every kind

in the Dominion. Consequently, although 718 miles of line was completed, nearly all of this was mileage on which work was far advanced and which it was advisable to push to completion. Among the more important projects of this nature was the Pacific Coast extension of the Canadian Northern, which was placed in service a few weeks ago. The Canadian Pacific Western Lines, which reported a total of 574 miles built in 1914, report only 23 miles opened this year. A further condition leading to this decreased mileage is the fact that the mileage of railways built in western Canada has expanded far more rapidly than the settlement of the country and as a result the railways can well afford to decrease their construction activities in this territory until the country develops more fully.

The causes for the unusual conditions in the United States are fully discussed in another column. It requires no argument to demonstrate that any conditions which have led to the almost complete cessation of railway construction activities in a country of the magnitude of the United States are wrong. Recent events indicate that this fact is being realized by the public and railway commissions alike and that the worst has been passed from this standpoint.

It is difficult to predict what 1916 will produce. A deeper realization of the needs of the railways on the part of the state and national commissions and of the public and a more favorable attitude on their part are reflected in recent rate decisions. The recent stimulus to railway traffic resulting from the movement of the heavy crops and war materials has created a more optimistic feeling among railway men and even at this early season plans are being prepared for a relatively large amount of railway improvement work involving large expenditures for next year. With the general revival of business the railways will find it necessary to make large expenditures for increased facilities, and, if conditions permit, many of the roads are planning to prepare for this condition as soon as possible. The year 1916 can be no worse and the indications are that it will be far better than the year just closed.

NEW BOOKS

Proceedings of the International Railway General Foremen's Association: Compiled and published by William Hall, Secretary of the Association, Winona, Minn. Size, 6 in. by 9 in., 265 pages. Bound in paper or leather.

At the eleventh annual convention of the International Railway General Foremen's Association, which was held at the Hotel Sherman, Chicago, Ill., July 13-16, 1915, a number of subjects were discussed which are of vital interest to those having to do with the maintenance of locomotives. An extensive report was made on piston valves, which covered not only the construction and operating features of the various types of valves, but also dealt with the maintenance of valves, valve packing, rings and bushings. A comprehensive report on valve gears was also presented. This contains considerable information relative to valve setting and maintenance of all types of all gears now in use on locomotives. Other subjects discussed are rods, tires, wheels, etc., shop efficiency, and oxy-acetylene welding. The report on the latter subject contains considerable information relative to generators and equipment installations, as well as the use of torches in locomotive repair work. The book is illustrated with a large number of line drawings and photographs.

Proceedings of the Twenty-third Annual Convention of the International Railway Master Blacksmiths' Association: Size, 6 in. by 8½ in., 226 pages. Bound in cloth. Published by the Association, A. L. Woodworth, Secretary, Lima, Ohio.

This volume contains a complete account of the proceedings of the last annual convention of the International Railway Master Blacksmiths' Association, which was held at the Hotel Walton, Philadelphia, Pa., August 17-19, 1915. Among the subjects discussed were flue welding, frog switch and crossing work, carbon and high-speed steel for tools, tools and formers, reclaiming scrap, and shop kinks. The volume contains a fund of information on these subjects which will be found of value to many blacksmith foremen.

Letters to the Editor

"SAFETY FIRST" IN EXCESS

REDSTACK, Ark.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

"Safety First," like every other great movement, loses its effectiveness in direct proportion to the extent that it is overdone.

I have in mind a railroad which I once served, where, when it rained, which was quite often, it was necessary for the train despatcher to issue an order to all trains on the division that a severe storm was in progress between certain points and that within storm limits they should run carefully, with extreme caution; take no chances, sacrifice speed to safety, not endeavor to make schedule time where conditions were unfavorable, approach all stations at reduced speed and keep a sharp lookout for soft track, washouts and slides where they were liable to occur.

In winter an order fully as long, but somewhat differently worded, was at once issued on the appearance of more than half a dozen snowflakes in the atmosphere. This form contained, along with other valuable information, the news that a snowstorm was imminent, and unusual care should be displayed in attending to switches, etc. Being near the seacoast, where fogs were frequent, we were also provided with a stereotyped "fog" order, which it was necessary to put out upon the slightest indication of a superabundance of vapor hovering over the landscape.

Weary of all this agony, the despatchers viewed approaching summer with relief, hoping that the weather bulletins would disappear with the inclement weather. But it was not to be. The first day that the sunshine was in evidence enough to bring out B. V. D.'s the assistant superintendent ordained that an order be issued to all enginemen to run carefully and look out for sun kinks!

Unless it is arbitrarily assumed that all trainmen and enginemen are deaf, dumb, blind and foolish and cannot recognize bad weather unless they have a meet order with the same, there should be no necessity for such methods. The mere fact that a man is considered worthy to command a train or drive a locomotive should guarantee his judgment in such matters. If certain men are naturally reckless and prone to flirt with danger they will do it regardless of a bushel of such orders; and yet we go on issuing them to the prudent and imprudent alike. The cases of careless men should be handled individually, and if they cannot be educated to a proper appreciation of their responsibilities they should not be retained in the service.

It should not be necessary for a train despatcher to sit with one eye and one ear trained on the weather, and at the first appearance of a disturbance among the elements put out a long-winded train order directing train and enginemen to do exactly what they are taught and expected to do in their routine duties without any special instructions in individual cases. It burdens the despatcher with unnecessary work and burdens the men on the line with useless train orders and diverts their minds from the proper interpretation and execution of more important orders. There are very few of them that do not regard these "rain," "fog" and other such orders as jokes.

The practice of issuing such orders seems to be becoming prevalent on many railroads, although the practice is a direct violation of the standard rule that train orders shall not contain information nor instructions not essential to the movement of trains.

Too much cooking spoils many a cake and in "Safety First" as well as in everything else a little judgment should be used. Zeal should be tempered with a little consideration of the exigencies of the case.

HOMER PIGEON.

The Railway Situation from Different Viewpoints

Julius Kruttschnitt; Frank Trumbull; Judson C. Clements; Robert R. Prentis; C. H. Markham; W. B. Scott; W. J. Eck; Frank Nay; George Gibbs.

PRESENT RELATIONS OF RAILWAYS AND THE PUBLIC

By J. Kruttschnitt

Chairman, Southern Pacific Company

Anyone who studies the present relations of the public and the railroads must conclude, however regretfully, that the public still lacks confidence in the honest intentions of the carriers, and that a lack of confidence exists on the part of the carriers in the fairness of the public. This absence of complete harmony and co-operation has behind it many years of history, which it would hardly be profitable now to review.

J. KRUTTSCHNITT
Chairman, Southern Pacific Company

Suffice it to say that at the beginning the conception of a railway as a public servant was little understood by railway stockholders, directors and other officers, and that the exaggeration of the private personal point of view at the expense of the public point of view led to many abuses. This attitude, while now almost entirely abandoned, still is occasionally evidenced, particularly in reckless financial operations that jeopardize operating efficiency and arouse hostile sentiments in the minds of all classes of the public.

Possibly because railroads are so vital to their existence, the people have too freely generalized from conspicuous cases of inefficient and dishonest management, and have manifested their condemnation in severely restrictive statutes that have, while restraining the guilty, at the same time hampered the innocent. The public has not been as fair in discriminating between good and bad railroads as between good and bad banks, for instance, which are also under federal and state control. In the case of banks, which are under close regulation, the public satisfies its sense of justice by jailing the dishonest officers, not by a sweeping statute restricting the natural and reasonable activity of banks in general.

FRANK TRUMBULL
Chairman, Chesapeake & Ohio

The mass of ill-considered, conflicting and oppressive legislation which hampers in so many instances that activity on the part of railway management that is essential to good service—which interferes with minute details of railway management under the guise of regulation, and at the same time evades all responsibility for results—has aroused distrust and suspicion in the minds of railway owners.

In such an infected atmosphere, nothing of enduring value in the way of regulation can be achieved. Harmony and co-operation between regulators and regulated must be established. It should be plain to the thinking public that its interest in good service—which is the fundamental consideration—demands an attitude of compromise at least, but, better yet, of cordial co-operation in achieving the result desired.

It is a simple thing to restore harmony and confidence, if both parties display a willing spirit. The railways appreciate the paramount necessity of public backing. Their shareholders and their officers and employees, themselves constituting a large part of the public, are eager and ready to meet their fellows more than half way. If, therefore, investors in railroad securities, shareholders, directors, officers and employees labor with the public, in season and out of season, in a spirit of trust and co-operation, they cannot fail to inspire a reciprocal spirit, and out of the new *relations* will be achieved that degree of progress in railway service that the public is rightfully demanding.

RAILWAY SECURITIES REGULATION

By Frank Trumbull

Chairman, Chesapeake & Ohio

I think there is no objection, and on many accounts it is desirable, that the issuance of railway securities in the future be supervised by the federal government, if the onerous and conflicting regulation as well as supervision by the various states of bond and stock issues can be done away with. This question is largely a banking function and is too delicate to admit of delays, either at Washington or at the state capitals. In saying this, I refer particularly to the question of prices investors may be willing to pay and which, as we all know, are subject to fluctuations, some of which are violent in character. Any company might fall into bankruptcy by not acting promptly at a favorable moment, and even when that is obviated delays frequently add to the cost of financing, a burden which ought to be saved to the public. This has been demonstrated many times. On the other hand, it would be entirely proper for the federal government to determine in behalf of all the states the purposes for which new capital issues may be made, and to require a strict accounting of the disposition of the proceeds realized by carriers engaged in interstate commerce, which, as we all know, embrace all the roads of the country.

Concerning the President's recommendation about railways matters in his address* to Congress on the 7th of December: I feel quite sure that the railroads do not object, but will welcome, a comprehensive inquiry by Congress into the methods of railway administration and regulation. If it is accompanied by a broad and tolerant spirit and an honest desire to get all the facts, I believe it will prove very helpful to all interests.

I am confident that there is a very much improved public attitude toward the railroads, and that, of course, provides a very helpful foundation for a fine piece of constructive work for the railroads by the federal government, similar to that already accomplished for the banks.

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* The president said in part:

"In the meantime may I make this suggestion? The transportation problem is an exceedingly serious one in this country. There has from time to time of late been reason to fear that our railroads would not much longer be able to cope with it successfully, as at present equipped and co-ordinated. I suggest that it would be wise to provide for a commission of inquiry to ascertain by a thorough canvass of the whole question whether our laws as at present framed and administered are as serviceable as they might be in the solution of this problem."

PUBLIC CONTROL OF RAILWAY CAPITALIZATION

BY JUDSON C. CLEMENTS
Member Interstate Commerce Commission

Before stating reasons which in my view call for some degree of public control over the issuance of stocks and obligations by railway companies, I desire to be clearly understood as not in favor of unnecessary legislation of any kind; for that which is not well considered, directed to the protection of rights by the prevention, suppression, or reparation of wrongs or the furtherance of the general welfare, and effected by means consistent with justice to all, is sure to produce harmful results in some direction. This is especially true in respect of legislation for the regulation of business methods of persons, whether natural or corporate. It is, therefore, only because I am convinced of grave wrongs, effected through improper capitalization, that could in large measure be prevented by reasonable limitations or restraints upon such issues, particularly as to bonds and other fixed obligations which when due demand their "pound of flesh," that I believe the time has fully arrived for the exercise of suitable public authority in prevention of abuses of this kind.

But the question is asked: How is the issuance of stocks, bonds, or notes by a corporation a matter of lawful concern to any member of the general public other than the corporation and the investors in its securities? An all-sufficient answer, it seems to me, is plainly apparent in the rate contests before the commissions and the courts, where questions of confiscation are raised in connection with the reasonableness of existing or proposed increased rates. In approaching these questions it is the almost universal method of the carriers in recent years, in cases involving rates on traffic of large volume, to show the gross earnings, the operating cost, the extent to which earnings have been diminished by fixed charges, including taxes and interest on obligations, and finally the balance available for dividends or a margin of surplus. Then when there results from this process no such balance as will afford a fair return upon the property of the shareholders, the need of increased revenue through increased rates is urged.

JUDSON C. CLEMENTS
Member Interstate Commerce Commission

It would, therefore, seem obvious that if there is to be no recognized relationship or connection between the capitalization of the companies and their rates, it must follow that their financial condition and the need of revenue with which to meet obligations imposed by such capitalization is immaterial and irrelevant to the question of the reasonableness of their rates, existing or proposed.

Whatever may be said of the relative insignificance of stock issues, especially in former times when the considerations pertinent to the determination of questions of reasonableness and confiscation in rate-making did not arise as they do now in the more advanced stages of public regulation and judicial interpretation, their importance cannot longer be questioned. This, I repeat, is especially true as to such specific obligations as bonds and notes.

While not conceding that the demonstrated need of increased revenue is of itself conclusive justification for increased rates, it is impressive to take note, from the viewpoint of the carriers, of the inseparable links in the short chain connecting capital obligations with the outgo of capital funds to meet them for whatever purpose, proper or improper, they have been issued, and the net financial results which are constantly pressed as pertinent and forceful in the determination of the reasonableness of the rates to be borne by the public.

Although for many obvious reasons the financial condition of a carrier or its need of additional revenue cannot be the exclusive or controlling test of the reasonableness of its rates, there seems to be no doubt of the relevancy of these considerations, along with others proper and pertinent, in arriving at just conclusions upon this subject. Otherwise, in its search for the reasonable maximum rates to be prescribed, how is the commission to avoid fixing them on a scale that might be confiscatory? How can the question of confiscation in rate-making be dealth with if we are to leave wholly out of view the financial results of operation as related to investment, or value and capital obligations? If, therefore, included in the capitalization of a company there be obligations, calling for interest from time to time, or dividends, as well as final payment of the principal, the issuance of which was not justifiable or representative of actual investment for the legitimate purposes of the carrier, then the financial results which we are called upon to consider in rate-making rest upon a basis that is unsound because it has been affected by an outgo of corporate funds used to meet the demands of securities which, but for the rights of innocent purchasers, in justice have little if any better standing than spurious issues.

Many millions of dollars in securities of the railways go into the vaults of the insurance companies, savings banks, trust companies and other fiduciary institutions, and in a propaganda on behalf of the carriers for increased revenue through increased rates or fares in order to strengthen their credit, it is but to be expected in the natural assertion of self-interest that these institutions line up in favor of the increases.

A restatement here of the facts disclosed in the investigations of the Chicago & Alton; the purchase of the stock of the Louisville & Nashville by the Atlantic Coast Line, in connection with which securities of the latter company, in bonds and preferred stock, were issued to the extent of fifty millions of dollars; the New York, New Haven & Hartford; the St. Louis & San Francisco; and the Chicago, Rock Island & Pacific, which show beyond question that directly, as well as through holding companies and otherwise, unjustifiable action of the sort to which I have referred has been taken on large scale, would outlaw this paper by reason of its length.

Briefly, some of the important facts disclosed by the investigation of the Chicago & Alton a few years ago are as follows: The books of this company, on December 31, 1898, showed that the value of the property was $39,935,887, and that the stock and funded debt and other liabilities amounted to $33,951,407. About this time the Harriman syndicate purchased the Chicago & Alton at $200 for the preferred stock and $175 for the common, or at a total cost of $39,042,200. Thence on until June 30, 1906, the capital indebtedness of the Chicago & Alton expanded from $33,951,407 to $114,610,937, an increase of about $80,000,000. Of this only $18,000,000 was actually expanded in improvements, etc., leaving $62,660,000 increase of stock and liabilities without one dollar of consideration. This was done by placing a $40,000,000 three per cent mortgage on the property to take up $8,500,000 of first mortgage bonds and to make improvements, additions and for "other corporate purposes." These bonds were sold to stockholders at about 66 cents on the dollar, the syndicate obtaining nearly all, owning at that time 218,138 shares of stock out of 222,306 outstanding. But only $32,000,000 of the $40,000,000 issue was sold, the syndicate disposing of what it had obtained at a profit of about $8,000,00. Of the remaining $8,000,000 issue $7,000,000 was pledged as security for a $5,000,000 loan and the remaining million was retained in the treasury. Out of about 66 cents on the dollar realized by the railroad the principal stockholders voted themselves a dividend of 30 per cent, amounting to $6,669,180, which was never reported to the Interstate Commerce Commission. What the stockholders obtained for all of them was not shown, but it did appear that

ten millions of them went into one of the great New York life insurance companies at about 96 cents on the dollar.

How many more such object lessons are necessary to demonstrate that the time has arrived to prevent for the future these indefensible practices, detrimental alike to the general public and hurtful to the good name and credit of American railways, both at home and abroad; to *bona fide* investors; and to the stockholders of the carriers other than those who invent, execute and profit by the schemes whereby these wrongs are consummated?

In answer to questions propounded to Mr. Cravath, attorney for Kuhn, Loeb & Co., the New York banking house that figured in the Chicago & Alton matter, he said:

> I think any fair-minded man must recognize that under existing conditions there is a call for a closer regulation of the issue of securities by semi-public corporations than has heretofore been the case. And yet we must not forget conditions that existed when these securities were issued.
>
> I quite agree that there is ample basis for the view that the time will come when attention should be paid to seeing that the par value of securities outstanding bears a definite relation to the value of the property against which they are issued. I think there is no doubt about that.
>
> But I quite agree that where securities do not bear some definite relation to the intrinsic value of the property, it becomes difficult in many cases to ascertain what the fair earning capacity is, and I shall not differ with you at all in advocating, under existing conditions, some regulation by law as to the amount of securities which should hereafter be issued against property and against earning capacity.

Publicity and exposure "after the fact," as we have seen in the list of disclosures above referred to, occurring since the Chicago & Alton matter, is wholly insufficient to prevent the repetition of these things. There should, I believe, be required such previous notice of proposals to increase capitalization as would insure publicity beforehand; at least, to some public federal authority; and in addition to this there should be vested in some public tribunal authority to veto or prevent a proposed issue, if after investigation and upon the exercise of a sound discretion, directed and controlled by law, such proposed issue is found not justified. Such limited authority might prove sufficient. It is worth trying before resorting to an elaborate system which may prove to be so rigid as to seriously impair the consummation of necessary and limited financial transactions in respect to which there is no apparent or probable cause for suspecting impropriety, after due publicity has been given.

It must be apparent that state authority, for want of that uniformity of action which is most desirable and of territorial breadth of authority, will never be adequate, especially as to large systems of railways traversing many states wherein the regulating bodies are vested with varying degrees of authority.

It seems improbable that the outstanding capitalization of railways can ever be purged of that for which there was either no proper reason for its issuance or a misapplication of the funds thereby derived, because to do so would, even if lawful, work gross injustice to *bona fide* investors who were not parties to their flotation. It must also be clear that wrongs once effected by improper and over-capitalization cannot be righted as to all victims. Prevention is the only adequate means of protection from the evil.

THE RELATION BETWEEN NATIONAL AND STATE RAILWAY REGULATION

By Robert R. Prentis

President, National Association of Railway Commissioners, and Chairman, Virginia State Corporation Commission

This is my response to your request to me as president of the National Association of Railway Commissioners for a short article on the relation between national and state railway regulation. It must be distinctly understood, however, that I am not speaking in my official capacity, but only expressing some personal views, and that I am alone responsible for what is here said.

The question has been discussed for many years, and with renewed interest since the decision of the Supreme Court of the United States in the case of Houston East & West Texas Railway Company, etc., v. United States, etc., 234 U. S. 342, commonly designated as the Shreveport case. This case decides that the prohibition against unjust discriminations as between persons, places, commodities, or particular descriptions of traffic, which are forbidden by section 3 of the act to regulate commerce, authorizes the Interstate Commerce Commission to require a common carrier to remove the resulting unjust discrimination against interstate commerce arising out of the relation between intrastate and interstate rates where the interstate rates are in themselves reasonable, and this notwithstanding the proviso in section 1 of the act that its provisions shall not apply to intrastate traffic.

In view of that proviso which reads:

> That the provisions of this act shall not apply to the transportation of passengers or property, or to the receiving, delivering, storage, or handling of property, wholly within one state and not shipped to or from a foreign country, from or to any state or territory, as aforesaid.

the decision came as a distinct surprise to the state commissions.

There has been much intemperate discussion on both sides of the controversy, and much darkening of counsel "by words without knowledge."

The other recent case which should be considered in this connection is Simpson v. Sheppard, 230 U. S. 352, which is the great Minnesota rate case. Mr. Justice Hughes, in the Minnesota case, discusses most elaborately the well-established doctrine that the states have the right to control intrastate rates, and with unanswerable logic and emphasis reaffirms the doctrine, subject only to the admitted qualification that the action of the state must not impose a direct burden upon interstate commerce, and must not be in conflict with the lawful provisions of the act to regulate commerce. In that case the point afterwards decided in the Shreveport case is expressly reserved.

The opinions in these two cases doubtless contain the last authoritative word on the subject, and the law as expounded therein will be accepted by all unless and until the Congress shall enact further legislation. Under existing legislation the question may be regarded as closed, and the law as expounded by Mr. Justice Hughes will be applied to future controversies.

In order to consider the Shreveport case intelligently, however, the limitations plainly expressed must be remembered. For instance, Mr. Justice Hughes, referring to the lower Texas intrastate rates, says:

> It is undisputed that the difference was substantial and injuriously affected the commerce of Shreveport.

And in another place:

> Here the commission (Interstate Commerce Commission) expressly found that unjust discrimination existed under substantially similar conditions of transportation, and the inquiry is whether the commission had power to correct it.

The whole result of this decision is made to depend upon the undisputed fact, which had been formally ascertained by the Interstate Commerce Commission, that the discrimination created by the application of the Texas rates to commerce moving between points in Texas substantially and injuriously affected and unjustly discriminated against interstate commerce. Having ascertained this fact the court determined that the carrier could be required to remove this discrimination against the interstate rates from Shreveport, Louisiana, to Texas points, which interstate rates had been already determined to be reasonable.

The opinion makes it apparent that the court is merely determining the precise question which it reserved in the Minnesota case for future decision, and that it was not intended in any way to limit the authority of the Minnesota case. This

is indicated in many ways. At one point it is thus expressed:

> This is not to say that Congress possesses the authority to regulate the internal commerce of a state, as such, but that it does possess the power to foster and protect interstate commerce, and to take all measures necessary or appropriate to that end, although intrastate transactions of interstate carriers may thereby be controlled.

So that the insistence that the decision in the Shreveport case practically eradicates state lines as to all railway rates is either the thoughtless expression of those who being interested in maintaining the authority of the states unimpaired take counsel only of their fears; or of those representing and advocating the railway interests in whom the "wish is father to the thought."

The decision then is carefully limited to the proposition that, if there is unjust discrimination in favor of the intrastate rates and against interstate rates which have been ascertained to be reasonable, then the Interstate Commerce Commission has the authority under the act to regulate commerce to require the railroads to remove such discrimination.

Whatever criticism may be made of the decision itself all well-balanced and just men desire to avoid unjust discrimination in rates, whether in favor of interstate or intrastate commerce. It is, however, believed that as wise men have either settled, or successfully temporized with, the great controversies arising out of our dual state and federal sovereignty in the same territory, so the true relations between national and state regulation will ultimately be well and wisely settled, and there is little danger that radical action will be attempted, either by state or federal authorities.

There are many things in connection with public regulation which the state authorities can do very much better than the federal authorities, such as the regulation of local rates, and the supervision of local officials, tracks, station buildings, and many of the instrumentalities used by the carriers in commerce. They can do many things far better than a central commission located in Washington, already greatly overworked, or the subordinates of such a commission, can possibly do. At the same time it is true that the federal commission can do many things that the state commissions cannot do, such as the regulation of interstate rates, and matters of a character which directly relate to and promote commerce between the states.

ROBERT R. PRENTIS
President, National Association of Railway Commissioners

The National Association of Railway Commissioners, composed as it is of the members of the Interstate Commerce Commission and certain of its officials, of the various state commissions and the Canadian commission and certain of their officials as active members, together with representatives from the Association of American Railway Accounting Officers and the American Electric Railway Accounting Association and others, as honorary members, was organized 26 years ago, and is maintained for the express purpose of avoiding and correcting the evils which were anticipated and have been developed by reason of the conflicts which sometimes, but not frequently, arise between federal and state regulations.

In its efforts for the last quarter of a century to bring about such uniformity as is desirable the association has not labored in vain.

Much of the criticism of the federal and state commissions, to which many seem to be so ready to give support, is inspired by those interested in obstructing and defeating all effective public regulation, and those criticisms which are most severe and extreme are generally based upon gross ignorance of the facts. The questions with which all of the commissions have to deal are frequently complicated and difficult and it is still true that sometimes commissioners, railroad men, and even editors "rush in where angels fear to tread," and with a word dispose of the most difficult problems which wise men confess themselves unable to solve. If those engaged in such thoughtless criticism would credit the public authorities with those things which have been accomplished, which all admit are for the general good, much better progress could be made. For instance, under public regulation rate wars have ceased; the evils of rebates and the abuses of the pass system are practically unknown; publicity in accounting has greatly enlarged the knowledge of railway men themselves as to the condition and progress of their business, and has promoted economy in transportation expenses and otherwise. Within the past three years the whole system of stating express rates has been simplified and improved. There is a disposition everywhere to make state legislation conform with federal legislation, although as to many reforms which are deemed wise by those who have given most attention to the subject the states have more frequently led than the Congress.

If those who are most interested in railway development will devote as much time to co-operating with the federal and state commissions as they do in their efforts to produce public distrust progress toward better things for them and for the public would be more rapid. However desirable it might be in the interest of simplicity and uniformity to have all the powers of regulation lodged in a federal commission, it cannot be demonstrated that such a radical change in our system would be either wise or produce any greater efficiency. It needs all the power of the federal government combined with all the power of all of the states to deal with these questions efficiently.

There are many strong men who are members of the National Association of Railway Commissioners. Many of them have rendered distinguished public service in other high official positions both federal and state. In ability and character they will compare favorably with any other body of picked men in the country, and it is believed that at no time in the history of the association has its membership been more earnest and patriotic or more determined to render valuable and efficient service to the country.

The dual system of regulation is here; it has come to stay, for the states will not surrender their authority. The state commissions desire, however, heartily to co-operate with the federal commission, with each other and with the public service corporations for the accomplishment of the best results. This co-operation between federal and state commissions has already to some extent been accomplished through the National Association of Railway Commissioners. When the railway authorities more cordially sustain and support such of their efforts as are wise many of the evils most complained of will disappear.

Co-operation then is the remedy for any conflicts, inconsistencies and discriminations which exist because of national and state railway regulation.

REQUIREMENTS OF OUR RAILWAYS IN A SYSTEM OF NATIONAL DEFENSE

By Charles H. Markham
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The efficiency of a country's railways as a part of a system of national defense will depend, first, upon the completeness with which they connect centers of population and production with outlying points upon the coasts or frontiers; second, upon the centralization, unanimity and efficiency of the operating control for military purposes; third, upon the physical condition of all the facilities of transportation and their capability of withstanding a sudden overload.

Our railway system would require less of extension than of unification to fit it for military purposes. An amplification of

the plan which appears to work successfully in Great Britain seems to promise satisfactory results here. So long ago as in 1871 the British government adopted the plan under which its railway system is now operating. There, as here, the railways are owned by numerous private companies. The resolution of 1871 provided that in case of war all the lines should at once come under the control of the government. The working out of the plan provides that actual operation of each road shall remain in the hands of its own officers and employees. On August 4, 1914, when war became imminent, an order in council put in effect the resolution. A railway executive committee was immediately organized, of which the president of the Board of Trade, a cabinet minister, became ex-officio chairman and the general manager of the London & South Western Railway acting chairman. Other members of the committee are the general managers of ten of the leading railways. Provision was made by act of Parliament for a net return to the railways during the period of government operation equal to the rate earned by them in the period immediately preceding.

Although the burden thrust upon the roads has been far in excess of what was anticipated and the expected duration of the arrangement has been greatly prolonged, its working appears to have been satisfactory to the government and to the managements. As a result of the scheme, Great Britain has in its hands a flexible means of transporting whole armies from one place to another with a celerity never before approached outside of a country whose railways have been constructed primarily for military purposes.

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While the system adopted by England is adaptable to American conditions, the nature and magnitude of the problems presented in the two cases are quite different. The railway board of Great Britain directs operations in a territory comparable in extent to New England, New York and New Jersey. The area of this part of the United States is a little greater than that of the United Kingdom, and the railway line mileage involved is somewhat less. The density of population of England is, of course, very much greater than that of this country.

There is an obvious relation between the territorial extent of a country and the importance of the service its railway system may be able to perform as a part of a system of national defense. The United States has a very large area. This means long boundary lines and frontier points far distant from the centers of population and production. Its boundaries consist largely of coast lines far apart. The completeness and efficiency of its means of internal communication are therefore matters of vital importance in the consideration of measures of preparation for possible war. It is conceivable that in a densely-populated country of small extent secondary means of transportation may serve with some approach to adequacy, but where distances are represented in thousands of miles, there are no secondary means of military transportation. If the primary means, the railway system, fails, the cause is lost.

The first step toward constituting our railways a satisfactory part of a system of preparedness should be a conference between representatives of the government and of the railways to decide upon the form of central organization which should have active control in case of war and to inquire into the measures that should be adopted to unify and improve the physical facilities. Such other measures as might be found necessary to provide for the efficiency of the operation of the unified system would also naturally follow under the guidance of the central organization.

Military authorities fully recognize the importance of such co-operative consideration. General Leonard Wood, formerly chief of staff and now in command of the United States Army in the Department of the East, in a recent discussion before the New York Railroad Club, said:

"The vast area of our country, our long coast lines, all make it most important that our use of the railroads should be upon carefully thought out plans. This includes many a little line which runs to some unimportant place commercially, but important nevertheless from a military standpoint. . . .

"Normally, our rail routes are potent agents in our national development and material betterment. This machinery of peace, which contributes so much to the tide of our prosperity, should be readily adaptable to defensive service if the occasion arise. But this would not be possible with us unless some scheme of general co-operation were agreed upon in advance, not only among the roads themselves, but as between the roads so united in purpose and the general government; in short, organization in the fullest sense of the word.

"The railroads and our military experts must be brought together and from their joint labors must spring a plan of reciprocal action, a scheme of interdependence that will evolve unity of working and instant readiness on the part of every railroad in the country."

Brigadier-General Tasker H. Bliss has recently contributed an article to the Journal of the Military Service Institution in which transportation facilities are considered at some length. He says, concluding a reference to the present inadequate condition of the railways from a military viewpoint:

"We often speak of the throwing—that's our favorite word for it—throwing great masses of men on this or that frontier threatened with sudden danger. We can stop the pulsation of the blood for only an instant without destroying the life of the organism; and the railroads are the veins and arteries of national life. They are none of them military; that is, none of them has been constructed with a secondary view to commerce and a primary one to military requirements. . . . The railway systems of the United States are an essential part of our military resources and must be first available in time of war. They become as much a part of the military organization as are the ammunition and supply trains of an army. There is no greater problem before us than the working out of a scheme for the orderly handling by railways of both military and civil business—a scheme for mobilizing the railroads, for making them able to move with the greatest effectiveness in war, without which schemes for the mobilization of armies will be of little avail."

Second in order, though perhaps not in importance, to the establishment of a controlling and operating organization, would be the adoption of measures toward putting the railway system in proper physical condition. These should take into account not only the main lines of communication, but all lines forming connection between the principal centers and isolated localities. Lines now seemingly insignificant might have an important service to perform as connecting links.

General Wood has answered the question, "What are some of the essentials toward putting the railroads of this country in position to meet the requirements of a system of national defense?" by in substance emphasizing the importance of bringing the railroads into a proper condition for efficiency in time of peace.

Under the general head of needed improvement in physical condition falls one item which requires special mention. The experience of European nations, and particularly Great Britain, in the present war, impresses the importance of extensive terminal facilities.

Handling rapidly a large volume of traffic, troops and supplies suddenly concentrated at a single point, is of the very essence

of successful military transportation. Present terminal facilities of American railways constitute one of their weaker points. Proof of this is afforded by the present condition at the ports. A heavy movement of freight of all kinds following closely upon a long-continued depression in traffic, has congested some of the principal ports to an alarming extent. It is commonly supposed that most of this congestion is due to the accumulation of munitions of war for export. This is not so. The growth of our export business is, of course, affected by war conditions in Europe. But the greater part of this freight is for the supplying of demands hitherto supplied by countries now at war. Statistics of the Department of Commerce show that for the month of October, 1915, the proportion of the whole export business of this country that could accurately and properly be classed as war material amounted to a little less than 11 per cent.

In time of war somewhat similar conditions might arise at any important terminal, whether on the coast or in the interior. There is also at the present time a heavy strain upon the facilities of railways far in the interior and which are only moderately affected by the increase in volume of export traffic.

These occasional congestions in times of peace are significant as indicating what would be likely to occur in exaggerated form under conditions calling for strenuous measures of defense. The present congestion shows how easily trouble may arise under abnormal conditions caused mainly by a sudden great increase of traffic. It also suggests that certain measures needed to prepare our railways to serve as a part of a system of defense are also required to put them in satisfactory working shape in time of peace.

Several causes have united to contribute toward keeping many of our railways in poor physical condition and unfit for handling increases in traffic due to a general return of industrial activity. They would be still more incapable of making the extraordinary exertions incident to service as an adjunct to a military organization. Heavy increases in wages and taxes have not been accompanied by corresponding increases in rates. In some instances they have been accompanied by decreases. Reduction in net earnings and inability to raise capital for needed improvements have been reflected on many roads in imperfect maintenance. Unpractical and inconsiderate demands on the part of local regulating authorities have added greatly to expenses and impaired facility of operation. An essential to putting the railways in position to serve properly as part of a system of national defense is a less localized and less selfish and short-sighted policy of public control.

A policy of regulation which constantly imposes new burdens and restrictions on them, and limits their profits as narrowly as the federal constitution will permit, is not adapted to preparing them to serve the public well and adequately, either in peace or war.

THE RAILWAY SITUATION IN THE SOUTHWEST

By W. B. Scott

President, Sunset-Central Lines

The railway situation in the Southwest, particularly in Texas and Louisiana, in which states our lines operate, while somewhat improved, is yet far from satisfactory. I see but small prospect of any permanent improvement until such time as there develops a better recognition of the difficulties surrounding railway operation and a better understanding and support on the part of the public, who should realize by this time that their best advertisement and their most effective solicitation in the matter of immigration is in the prosperity of their transportation lines. I say here "best advertisement and solicitation" because both Texas and Louisiana are agricultural states with great promise, and an equally great need of high-class, intelligent and enterprising farm owners. These the states could not hope to secure, for success feeds upon success, and if the railway systems of any section are operated by receivers and struggling for existence, the condition would seem to suggest an equally hazardous and precarious situation as affecting all other lines of commercial endeavor.

Of the 12 more important railway lines or systems operating in Texas, 5 are being operated by representatives of the courts because of their inability to meet their operating expenses and other obligations from their current income. I am satisfied that those which are still operated by their owners have escaped the fate of their neighbors only through rigid economies and through more favorable local conditions, rather than through any special or particular privilege or emoluments. The same conditions which have oppressed the lines now in the hands of receivers have applied with a like force, differing only in degree, to the lines which still retain their own autonomy and direction.

In considering the handicaps which have for the past several years deterred the progress of the Texas transportation lines, I am hardly prepared to suggest that, or those, which represented the greatest obstacle to success. Suggestion may have been present, for with an example set prominently by our national government in the matter of restrictive and possibly unnecessary legislation, it is not particularly surprising to witness state legislatures going Congress one better, adding to the burdens of the railways and always failing to provide means or opportunity for recouping revenues in order to meet constant additions to their operating expenses.

I do not assert that legislative acts have been the main contributing factors, but rather than they have contributed their quota to a general situation. Neither do I suggest that commission regulation of railroads is altogether unnecessary. Possibly the cause as represented by some lines or group of lines may have made commissions a necessity, for no one with propriety may claim an exception to proper regulation, but "over-regulation" ofter follows when once the excuse is suggested. It is a sad commentary upon the equity of government, yet nevertheless true, that commissions sometimes fail to recognize that they set as judges of questions involving the rights of both the people and the corporations, and in some instances incline to the role of prosecutor for the people alone. The adjudication of differences demands that both sides of the shield be read. There is some fallacy in any reasoning which forbids an increase in rates when the expenses are greater than the revenues. This principle is exemplified and well illustrated by the action of tax boards, which by various direct and indirect methods replenish their depleted treasuries by an increased assessment of railway properties out of all proportion as compared with the increases assessed against other properties. In 10 years the taxes of Texas lines have increased 267 per cent, and of Louisiana lines, 156 per cent.

I am satisfied that the commissions are trying honestly to work out a basis whereon differences may be amicably adjusted, but the very nature of the business would seem to require the cool, dispassionate judgment of men thoroughly familiar with railroad details, including rates, to pass intelligently upon the mass of technical detail that environs the operation of a rail line. This cannot be absorbed in its entirety, and while not of any extreme difficulty, personal familiarity alone can make these details comprehensive in all of their many phases. Our commissioners, or most of them, are able and sincere, but if they cannot, as I suggested, give to the problems confronting them the benefit of a really expert personal knowledge, I fear they will have just as decided a difficulty in absorbing second hand information from individuals whose knowledge of the facts often is not thorough. Reasons for rates, direction and balance of traffic, physical complexities, grades, distribution of power, equipment and fuel, and a multitude of other important considerations must be apparent and understood before conclusions can be either fair or satisfactory.

There are other factors, however, which nature and topography in this section have made pertinent. Floods and storms of the past three years have created havoc, both in their immediate damage and as a cumulative result. Roadbeds have been

washed and rewashed, softened and kept soft, materially increasing the cost of current operation and requiring large sums for replacement and repairs. Bridges, structures and equipment have felt the burden; not once but many times, while expenses of train operation have coincidentally shown very pronounced advances, overtime and fuel not the least of these, with disordered schedules and an impatient and not always considerate public.

Texas is a state of considerable distances. Much of the transportation is through territory interminable in extent and unproductive as to local business, yet these sections of the line must be operated and maintained despite the lack of revenue from intermediate sources, the through haul being charged with the burden of upkeep. To this, and the situation practically applies to the north and south lines as well as the transcontinental railways, are added the unsatisfactory freight conditions represented by the long and expensive haul of empty equipment, due to the unequal movement of business, which is frequently 65 to 80 per cent one way, necessitating equalization of power, equipment and crews, which adds heavily to expenses with no attendant revenue.

Loss and damage claims in this territory make heavy inroads into the earnings of the carriers. This is partly due to the long hauls on perishable commodities and the opportunity for deterioration enroute. The return empty movement of special equipment, unsuited for other traffic moving in that direction, is also a considerable item of expense. Again, the carriers often suffer heavy loss through the shipment of live stock and market conditions, and also, perhaps, the natural disposition of some shippers and consignees to capitalize the disability or unavoidable delay on the part of the railway.

W. B. SCOTT
President, Sunset Central Lines

The viewpoint of the public as to moral obligations in relation to physical conditions must vary in the several states. This is evidenced by the attitude of certain Texas juries in determining personal injury verdicts and damage claims. Legitimate injury and damage claims are, as a rule, not difficult to adjust when negotiations are between the claimant and the railway, but claims of a doubtful character and those where no actual injury or damage exists, ordinarily termed "fake" claims, which are made the subject of a damage suit, are mainly responsible for the heavy tax upon our revenues, such payments having increased from $165 per mile in 1906 to $275 per mile in 1914. Perhaps a more striking comparison is in the payment to this account for the year 1900 the amount of $1,018,637, while for the year 1914 the total payments had increased to $2,905,327, an increase of 185 per cent, with an increase of only 60 per cent in train mileage. From this showing we would naturally conclude that railroading in Texas was more hazardous than elsewhere, but the contrary is the case, and it is safe to say that a very great portion of the amount mentioned was unwarranted by fact, but the drain continues to increase notwithstanding. Sentiment rather than responsibility is too frequently the governing factor, the law often being disregarded as well as the disposition or willingness of the railways to recognize even an implied liability in the settlement of such obligation as exists.

The situation today, and this is demonstrated by the receiverships recently inaugurated on a number of the smaller purely local lines, proves that no Texas railway can be profitably operated without a large quota of interstate traffic, and even then the results are questionable, as indicated by the receiverships on lines which do an interstate business.

Such of the transcontinental railways as have remained solvent have done so because of the volume of traffic which came to them from their interstate connections and which enabled them to meet their expenses, when, if they had been dependent upon a purely local or intrastate business, they would more than likely have gone down in defeat.

One of the main sources of revenues of the Texas lines is in the carriage of cotton, yet few realize the great expense and risk attending this business, owing to loading and compress charges, insurance, light tonnage loading, handling into and out of compresses, all without extra charge and all trenching upon the efforts to make both ends meet and realize a margin of profit from their handling of freight—handicaps railways in other sections are not compelled to bear.

Generally speaking, conditions are not altogether normal and we may not be compelled again to take care of a loss of over a million dollars, speaking for our Sunset-Central Lines, caused by storm conditions, nor witness again the utter demoralization of business by war scares and impairment of the value of cotton and other southern commodities. The southern roads do not serve a manufacturing territory and few penetrate the great grain-producing belt; therefore they have participated but little in the prosperity that has come to other lines as one result of the European struggle. There will be an urgent necessity for positive economies with us for a long time to come yet. The $13,000,000-dollar deficit of the Texas lines for the past three years cannot be made up by a few good months. The heralded wave of prosperity which the northern half of the country is experiencing has only touched us, but we have hopes that the real stringency is about over.

I am inclined to believe that popular and unreasoning prejudices against railroads are getting to be a thing of the past and that the rights of the carriers are being recognized more and more by the people and the government. At least I hope so.

SIGNALING PROGRESS IN 1915

By W. J. Eck

Signal and Electrical Engineer, Southern Railway*

Progress in railway signaling during the year 1915 was marked by a few notable developments rather than by the quantity of work installed. The signal departments have borne their proportion of the general retrenchment required and many economies in operation have been effected. The reduction of forces has resulted in considerable study being given to the subject of combined maintenance. The combining of track and signal forces is still used to some extent where originally installed, but has made practically no progress elsewhere. The consolidation of the signal, electrical and telegraph departments is more promising and has been effected on a number of roads. On account of the similarity of the duties of the three departments, all having to do with electrical affairs, the arrangement is a logical and economical one.

The most marked tendency of the year has been the very extensive use of alternating current for the operation of signals on steam railways. First employed on electrified lines from necessity, its advantages were so apparent that its use has rapidly extended to steam railroad lines, and the coming years will probably see it used with the majority of semaphore signals installed.

"Light" signals consisting of electric lights with various colored lenses have been used for a number of years on electric lines where cheap power was available and where speeds were moderate. Such signals are also in general use in snow sheds and tunnels on steam lines. An entirely new improvement of the light signal, known as the "position light," has been developed which is suitable for both day and night service in the open on high-speed railroads. An extensive installation of these signals was made during the year on the Pennsylvania Railroad

*Mr. Eck is now president of the Railway Signal Association.

and is now in successful operation. The possibilities for the future use of this signal are very great on account of its having no moving element and its peculiar adaptability to roads using alternating current for signal operation.

Single-track automatic signaling is receiving an increasing amount of attention and the mileage installed during the year greatly exceeds that on double track. It has been only a few years since railway officers believed that automatic signals on single track would hinder instead of facilitate movements. Particularly since the so-called "absolute permissive block" has been developed has this idea given way to a realization of the safety and aid that the system affords. In the A. P. B. system for single-track signaling the trains are given an absolute block from passing siding to passing siding for opposing trains and a permissive block for following trains. This system has been almost exclusively installed during the past year.

There has been a substantial decrease in the miles of track protected by manual block owing to the substitution of automatic block signals in its stead. This was also true in 1914 and can reasonably be expected for a number of years to come unless a law should be passed requiring the immediate installation of block signaling on all lines, in which case the manual system would be the only one that could be installed in a short time.

The use of electro-mechanical interlocking, that is, interlocking where the power for operating switches and derails is manual and for the signals, electric, shows continual growth due to the satisfactory operation of such plants. The use of switch and lock movements and the elimination of separate levers for facing point locks is a development of the year. Such plants reduce the size of machines necessary and with switch indication circuits, concrete foundations and heavier construction now used in signaling, no element of safety has been sacrificed.

W. J. ECK
President, Railway Signal Association

On railways where white is used as a proceed signal there is always the possibility of a false proceed indication due to a broken lens or roundel in a stop signal. This possibility, though very rarely causing an accident, is always present and each year sees the gradual adoption of green as the color indication for proceed on some railroads. This year has been no exception, one prominent road in the south having completed the change from white to green in the past few weeks.

The Division of Safety of the Interstate Commerce Commission has secured the services of an experienced and well-known signal engineer during the year. His advice and counsel will, it is believed, do much to prevent hasty and unconsidered legislation affecting railway operation and, particularly, block signaling and automatic train control. The appointment of an experienced man to this position was of peculiar interest to the railways just at this time when Congress has before it a bill to expand the jurisdiction of the Interstate Commerce Commission to cover operating matters.

Valuation of the signal appliances on a number of railways has been started during the year in connection with the federal valuation. This work has required the services of many signalmen both by the government and the railroads. It is only because of the general depression in construction work that the railways have not been required to materially increase the signal engineers' forces to take care of this work on roads where it is now under way. This work is generally handled under the supervision of the signal engineer, his forces making the detailed inventory and obtaining the required records. The Presidents' Conference Committee on Valuation has appointed a subcommittee of signal engineers to prepare data and to handle such signal matters as are assigned to it. The committee has been quite active throughout the year.

An interesting development during 1915 has been the extensive introduction of American signal devices and American signalmen on Australian railways, a field which has heretofore been occupied exclusively by the products of Great Britain, and this, with the American signaling appliances that have been put in service on English railways, where signaling was born, says much for the state of the art in this country.

Except for a few small installations for experimental purposes there has been no installation of automatic stops or cab signals on steam roads. The Brooklyn Rapid Transit, an electric subway line, is installing an automatic stop and cab signal system with speed control features which is of interest on account of the control being continuous, the brakes being applied whenever the speed at any point exceeds a predetermined amount as obtained from a braking chart. A speed control of this character prevents much of the serious decrease in capacity which will result from a simple automatic stopping device.

The Railway Signal Association has continued its work of standardization during the year, so that a majority of the parts used in signaling and interlocking are now standard. The uniformity established by the association has resulted in material savings to the railways and it has had much influence for good in the advancemnet of the signaling art generally.

The coming year promises to be the most active in the volume of signaling installed ever experienced on American railways.

PROGRESS IN ELECTRIFICATION DURING 1915

By GEORGE GIBBS*
Consulting Engineer, New York

During a year of great disturbance in all business conditions little has been done in the way of initiating new railway projects, but the period has witnessed the completion of two very important electric traction installations and the partial completion of a third on steam railways. All three represent departures in important details from previous installations and practical results will be watched with interest.

On the Norfolk & Western a freight haulage installation was undertaken to relieve the congestion by an increase in train speed and also to produce operating savings on the main line heavy grade division over the Alleghany mountains; it is conducted under unprecedented conditions as to density of traffic and train weight.

The suburban passenger train electrification of the Pennsylvania at Philadelphia is an application under complicated terminal conditions of an electric system which is designed to be adapted for future extension over long distance main lines and to then handle all classes of service.

The Chicago, Milwaukee & St. Paul electrification in Montana and Idaho applies electric traction to heavy train units, both freight and passenger, on a line having heavy traffic and over the longest distance yet attempted; it is being carried out by an electric system quite different in detail from that employed on the two railways first mentioned.

These installations, added to others already in operation, furnish examples representing practically all conditions and kinds of railway service. Their purposes are various. Electric traction has been employed to make underground terminals in large cities practicable; to facilitate safe operation in long tunnels; to increase the capacity of lines or of passenger terminals; and to increase the operating capacity on heavy grades. In certain of these cases increased economy of operation is an important and perhaps a controlling consideration. The reasons, therefore,

* Mr. Gibbs is chief engineer of electric traction, Long Island Railroad, consulting engineer, Norfolk & Western, in charge of electrification over Elkhorn-Summit, and consulting engineer, Pennsylvania Railroad, in charge of electrification work at Philadelphia. Mr. Gibbs is also chairman of the committee on electrical working of the American Railway Association.

have been either compelling ones from an operating standpoint, or those connected with expected economies.

The success of this form of traction may be viewed from different standpoints, accordingly as the inquirer sets the problem for himself. Technically, it has been amply demonstrated that electricity can propel trains of any weight at any speed, not limited by other considerations, and that the apparatus required will function reliably; in fact, notwithstanding the complicated mechanism involved and the circumstance that an electric system is tied together from the power house to the trains, thus requiring that all links must operate to secure service, operation has been found remarkably reliable, and, in this respect, an advance on steam operation which it superseded.

Increased capacity has been obtained from electric operation, both as the result of its ability to concentrate almost unlimited power at the train, and thus increase speed and hauling capacity under adverse conditions, and because in certain kinds of service, such as suburban passenger, multiple unit motor car operation is substituted for head end locomotive operation, thus reducing shifting and idle movements in congested terminals.

As regards the aspect of economy, this is not yet as clearly defined as might be expected, considering the number and variety of installations already made. Some of these installations are as yet too new to furnish comparison, but a factor of more importance is that in nearly every case new conditions have been introduced with the new form of traction, and thus the same things cannot be compared. Another fact is that the actual cost of an existing steam service is frequently as much in doubt as the probable cost of electric operation which is to replace it. This peculiar condition exists because railway accounts are not thoroughly segregated for the cost of each part of the equipment or for each operating division as a whole, much less for a particular service on part of a division, as is often required.

Generally speaking, the most attractive fields for electric operation from the standpoint of increased direct net money return on the investment are: (1) where traffic is dense over an entire division and where the train loads, or speeds, or both, may be increased by electric operation, thus utilizing motive power more effectively than with steam; (2) for traffic having a high load factor, i. e., a fair degree of uniformity throughout the day, so that trains may be operated with reduced power and labor costs. Long lines with thin traffic and terminal station operations do not generally furnish an attractive field for electric traction from the standpoint of operating savings, although in some cases such installations may prove profitable where the cost of energy can be largely reduced by obtaining it from cheaper sources.

The indirect benefits of electric operation are, however, often controlling in any installation, and among these may be mentioned smoke elimination in tunnels and underground terminals, increased comfort, speed and attractiveness in passenger service, and the increased line capacity referred to above.

It is, therefore, to be expected that electric traction will continue to develop as regards methods of application, and will be used in the many cases where it is well suited to or is required by surrounding conditions. Electric traction apparently cannot supersede steam traction for all, or for even a very large part of the railway mileage of the country, unless some radically new type of apparatus should be developed, a contingency which, unfortunately, does not seem at present to be pending.

A word may be said regarding the technical developments which have occurred or have become realized during the past year. Electric traction has for several years been tending towards extension to long distance or, rather, to entire divisional operation; this is in many cases almost essential for proper railway operation, as intradivisional transfer of power or train is costly and inconvenient. Long distance and heavy train-unit traction has made a change desirable from the expensive method of distribution of low tension direct current power to the trains by third rail conductors, which requires large capacity of feeders and sub-station machinery. The three installations completed this year all illustrate the present tendency to use an overhead trolley wire of small size, but large power capacity, by reason of the high potential of the current carried. The Norfolk & Western and Pennsylvania installations use an alternating current system throughout and distribute current at very high potential; the St. Paul's installation uses direct current in the trolley wire at a potention which is high compared with that used in a third rail, but low compared with the practice in alternating current systems. Standardization, therefore, of electric systems as a whole cannot be said to be complete, but progress has been made towards the use of overhead conductors as a standard, and, in the case of the alternating current systems, towards uniform characteristics of the current used in the working conductors.

We may, therefore, as regards further deevlopments, properly await experience with the two overhead systems now on trial. The relative first cost of these two systems does not appear, from present information, to differ greatly and the further development of both will doubtless proceed for some time. It may well be that both will find a place in heavy railway work unless one of them is shown to be greatly superior as regards simplicity, reliability and cost of operation. It is especially important, therefore, that each new installation undertaken should be based upon a competent examination, not only of the railway operating features, but of the complex technical developments now taking place, in order to clarify the problem for the future.

ENDING THE FISCAL YEAR ON DECEMBER 31 INSTEAD OF JUNE 30

By Frank Nay

Controller, Chicago, Rock Island & Pacific

The Interstate Commerce Commission was created by an act of Congress in 1887. The act required annual reports from railroads to the Interstate Commerce Commission for the years ending on June 30,—that being date for closing the governmental fiscal year. Prior to that time the railroads closed their fiscal years on various dates, according to their own convenience. Later on, when the various states required annual reports from railroads similar to those to the Interstate Commerce Commission, they also adopted June 30 as the close of the report year.

Under these conditions a large majority of the railroads closed their books two times each year and rendered two separate annual reports covering different periods, one covering their own fiscal year to their stockholders and directors, and the other for the year ended June 30 to the Interstate Commerce Commission and to the various state commissions. This caused a duplication of work, and, owing to the fluctuations of traffic and operating conditions in different seasons of the year, the annual reports to the stockholders frequently appeared to be out of harmony with the annual reports to the Interstate Commerce Commission and the various state commissions. Consequently, nearly all the railroads in the United States changed their own fiscal years to agree with those of the Interstate Commerce Commission.

As the years went on, serious objections developed to June 30 as the date for closing the fiscal year, among which were the following :

1.—On the majority of the railways of the United States the programs of maintenance and improvement work conform naturally to the calendar year, and in reporting the details of such work, a year ending December 31 has decided advantages over a year ending June 30. The maintenance and improvement forces are at the maximum and the heavy work is in progress on June 30, while December 31 is the natural close of the year for maintenance and improvements.

2.—Annual reports, the compilation of which is so much work added to the daily routine, can be more easily prepared during the winter than during the summer season, on account of vacations in general offices, and the slowing up, as a rule, of accounting work.

3.—December 31, coming at the close of the season for main-

tenance work, is a better time than June 30 for taking the annual inventory.

4.—Many carriers are required to make extensive reports to state commissions and taxing bodies, covering a calendar year period, for purposes of taxation, thus duplicating much of the work included in the report for the fiscal year ended June 30. The two reports may present more or less apparent variance which would be overcome by having both cover the same period.

5.—The present plan of closing the fiscal year for railroads on June 30 prevents satisfactory comparisons with other great lines of industry, as nearly all the latter close their fiscal years on December 31.

These objections were presented from time to time to Henry C. Adams, in charge of statistics and accounts for the Interstate Commerce Commission, by the accounting officers of various railroads in their conferences with him concerning the uniform system of accounts formulated and promulgated by the Interstate Commerce Commission. He presented the matter to the Interstate Commerce Commission and the National Association of Railway Commissioners, which latter association appointed a committee of which Mr. Adams was chosen chairman, to canvass the situation and report the result. Under date of July 28, 1909, Mr. Adams issued an inquiry to all of the carriers in the United States reporting to the Interstate Commerce Commission, calling on them for an expression of opinion on this subject, by propounding to each one of these carriers the following questions:

1.—Would you approve such a change in date?

2.—What reasons occur to you as pertinent why such a change should be made?

3.—In case you oppose making a change, what reasons occur to you as pertinent for retaining June 30 as the date for closing the fiscal year?

Coincident with the inquiry among railroads, he also solicited opinions from the various state railway commissioners. Mr. Adams reported that the result of these inquiries did not indicate any great desire either on the part of the carriers or the state railway commissioners for a change in the date for closing the fiscal year for railroads; in fact, many of the state railway commissioners opposed the change for the reason that to make the change would require statutory enactment on the part of 22 states. However, in 1910 the act was amended so that the Interstate Commerce Commission may change the fiscal year from June 30 to December 31.

FRANK NAY
Controller, Chicago, Rock Island & Pacific

It is believed that when the first inquiry was sent out by Mr. Adams, the subject was not given careful consideration, and from time to time the matter was discussed by railway accounting officers. In March, 1914, at a special meeting of the Association of American Railway Accounting Officers, a special committee was appointed to bring this matter again to the attention of the railroads and a circular was sent to all railroad accounting officers in the United States, propounding the following queries:

1.—Do you approve of the suggestion to change the period covered by the annual report to the Interstate Commerce Commission from the 12 months ended June 30 to the 12 months ended December 31?

2.—Please state as fully as possible your views in favor of or against the proposition.

3.—Lines for which answer is made; total operated mileage of the same.

In response to that circular, replies were received from railroads representing 271,867 miles operated, of which roads representing 212,542 miles or 78.2 per cent of the total miles operated recorded their votes in favor of the change, and roads representing 13,939 miles, or 5.1 per cent of the total mileage operated, were indifferent, leaving roads representing only 45,376 miles or 16.7 per cent of the total as recording themselves in opposition to the change. Subsequently, some of the latter roads changed their votes, and recorded themselves as favorable to the proposed change. Those who opposed the change offered the following reasons:

1.—Comparisons would be disturbed.

2.—It would be necessary to have stockholders change the fiscal year for most of the railroads in the United States.

3.—It would be necessary to have the statutes of 22 states changed.

As to these objections, it may be stated, in passing, that they are not at all serious, because: comparisons would be disturbed for one period only and one supplemental report relieves that situation; it would not be a serious hardship for the stockholders to change their fiscal years from June 30 to December 31; and since the Congress of the United States has already amended its law so as to permit the Interstate Commerce Commission to change the date for closing the fiscal year from June 30 to December 31, whenever it sees fit to issue an appropriate order, it should not be difficult to induce the 22 states referred to to enact similar amendments to their laws.

The report of the special committee was presented to the Association of American Railway Accounting Officers at its annual meeting in Atlanta, Ga., April 28, 29 and 30, 1915. The matter was referred to the executive committee of the association with power to deal with federal and state commissions relative thereto. Subsequently, the executive committee sent communications to all of the members of the association, inquiring if the executive officers of the railroad concurred in the vote of the accounting officers as registered in the replies to the circular sent out by the special committee. The replies to this latest inquiry indicate that the executives of railroads are now very much interested in this subject, and substantially all executives whose accounting officers had given replies favorable to the changes support their accounting officers. Some executives whose accounting officers voted against the change take a different view and favor the change. At the present time it may be safely stated that the desire for a change is nearly unanimous on the part of railroad companies.

R. A. White, president of the Association of American Railway Accounting Officers, delivered an able address before the National Association of Railway Commissioners at their annual convention in San Francisco, Cal., held in October, 1915, in which he presented in a very convincing way, the need for this change in the fiscal year. While Mr. White gave several reasons, he particularly emphasized two which should appeal strongly to all, viz.:

(*a*) The programs of maintenance and improvements conform naturally to the calendar year, as such programs are commenced during the early part of the calendar year and are completed during the latter part of the calendar year. At June 30 they are in their busiest stage. Erroneous impressions may be conveyed in the annual reports because in one year the climatic and business conditions are such that a majority of the maintenance and improvements programs may be completed prior to June 30, while in the succeeding year a majority of work covered by such programs may be deferred until after June 30, but these programs are always substantially near completion at December 31.

(*b*) Nearly all of the officers and as many as possible of the clerical force like their annual vacation at a time of the year when it really counts for something. Few men can really have a good time in winter; most of them want to get away during the summer for rest and recreation. No one would maintain that

a vacation should take preference over reports to the various commissions, but with the fiscal year closing on June 30, the heaviest work for the clerical forces of a railroad occurs in July, August and September, during which time the weather conditions are most depressing and during the very time when these men would like to have vacations. During the period of the preparation of annual reports it is necessary for the clerks to work overtime more or less, and the officers who have to supervise the preparation of the reports must perform such supervision in addition to their regular duties during the heated season of the year. If the fiscal year closed at December 31 this pressure would come during January, February and March, —a time of the year when the weather conditions inspire vigor and activity.

The present year ending June 30 consists of six months of one year added to six months of another year, while the calendar year is the logical business year. Therefore, in the interest of producing more useful annual reports of railways covering a 12 months' period, closing at the end of the logical business year which will reflect more nearly than any other, on the whole, their true financial conditions, their true income accounts, and the true additions and betterments to their properties, it is most desirable to have the fiscal year end on December 31.

1915 FROM THE CONTRACTOR'S STANDPOINT

By W. A. Rogers

President, Bates & Rogers Construction Company, Chicago, Ill.

The year just closing is unique from the standpoint of the railroad contractor. During the past year less miles of railroads have been built in the United States than in any year since 1864. In 1915 only 933 miles of main line was completed in the United States, and 718 miles in Canada.

In past years we have been in the habit of comparing periods of depression in railroad construction with the years immediately following 1893. We will now have to start with a new date. There was 495 miles less railroad completed in 1915 than in 1895, which was the year of least railroad construction in that period of depression. There have been only four years since 1848, and 1915 was one of these, when less than 1,000 miles of new line was completed. When we consider that the normal amount of railroad construction completed in a year runs from 3,500 to 4,000 miles, we can realize why 1915, with its 933 miles, has seemed such a quiet year. It is a significant fact that during this year not a railroad in the United States built 100 miles of line. In fact, the greatest mileage reported by any road is in Alabama, where one road reports 52 miles of main track constructed. Only one state in the Union has added to its mileage as much as 100 miles of railroad.

Many causes have contributed to the dearth of railroad construction. It would be a wise man, indeed, who would be able to give all of the reasons and to name them in the order of their importance. One of the principal reasons has been the attitude of our law makers and other public officials toward the railroads. The shortsighted policy which has resulted in the practical abandonment, during 1915, of expenditures for the construction and improvement of the railroads has had undoubtedly an immense reflex action on the prosperity of the country. The railroads have not had the money to spend, with the result that the thousands of men who would ordinarily have been employed in the various construction activities have been idle. There has also been a corresponding depression in the various lines of business involving materials of construction and other railroad supplies.

The result of this lack of railroad construction has been a very quiet year for railroad contractors. Only a very small number of contracts of any size have been let during the year, among the largest of which were those for the Norfolk & Western cut-off near Farmville, Va., and the Chesapeake & Ohio extension in Ohio. The Lackawanna cut-off has been completed during the year, as well as the Canadian Northern's transcontinental line. There has been very little railroad work going on elsewhere in Canada, and practically no new work has been started there. Good progress is being made on the Rogers Pass tunnel of the Canadian Pacific, which was started in 1914, and there has been some terminal work in eastern Canada.

With this dearth of railroad work, the contractors who have followed this class of construction in the past have, in many instances, turned to other fields. They have taken up river and harbor work, reclamation service work, mine stripping, various forms of municipal and power development work, building construction and road making. By spreading out into different fields many of the railroad contractors have kept busy.

The labor conditions throughout most of the United States have been good during the greater part of the year, although during the latter part of the season the war order business in the East has caused some shortage. Prices for contract work during 1915 have been very low, and work has been figured on closer margins than in many years. Many contracts have been taken simply to keep the contractors' organization intact. As we draw to the close of 1915 I think that the railroads, the railway supply men and the railroad contractors are all glad to write "Finis" to a very quiet year and turn over the page.

Beginning about September, railroad earnings began to show an improvement, resulting, in considerable measure, from the handling of war order business, and later from the moving of the most bountiful crops in the history of this country. As the year is closing the railroad earnings are showing a remarkable improvement. I believe we can look forward with confidence to a good year in 1916. Over 1,200 miles of new line is now under construction, about 1,625 miles additional has been surveyed ready for construction, and projected lines amounting to over 2,060 miles are being seriously considered. In view of these facts and considering also the changed attitude of the public, the newspapers and the law makers toward the railroads, coincident with the increased earnings and the general increase of business throughout the country, a more optimistic feeling is apparent among those who are dependent upon the railroads for business.

Railroad construction work will cost more in 1916 than in 1915. Prices for materials have advanced and are advancing. If any large amount of construction work is undertaken the labor supply is almost certain to be very short. In addition, those contractors who have been willing to take work at cost, simply to keep an organization together, will undoubtedly be relieved of this necessity by the fact that there will be more construction work to bid on. One of the serious problems is going to be the labor supply. When we consider the number of men who have gone to Europe to join the armies of the various warring nations, with the sources of further supply practically closed, one can realize what we may have to contend with when construction work really starts. With this in view it would seem to be the part of wisdom of those who expect to undertake work the coming season to start as early as possible in order to get organized early in the season before the shortage develops.

As we look back over 1915 and forward to the coming year we cannot help feeling that we have now really come to the turning point, that a new era of prosperity for the railroads and allied interests is just starting, and that beginning with 1916 we will have a steadily increasing period of prosperity.

Railway Construction in Spain.—It is officially announced in Spain that projects will be received at the Dirección-General de Obras Públicas, Ministerio de Fomento, Madrid, up to May 21, 1916, for the construction of a secondary railway from Palencia to Aranda de Duero. The line will be of meter-gage. The average cost per kilometer must not exceed 100,000 pesetas (about $20,000). The minimum weight per meter of the rails to be used will be 30 kg. (66 lb.)

The Trend of Railway Earnings in the Year 1915

Results as Shown by Net Earnings Compare Favorably with 1914, but Principally Through Savings in Expenses

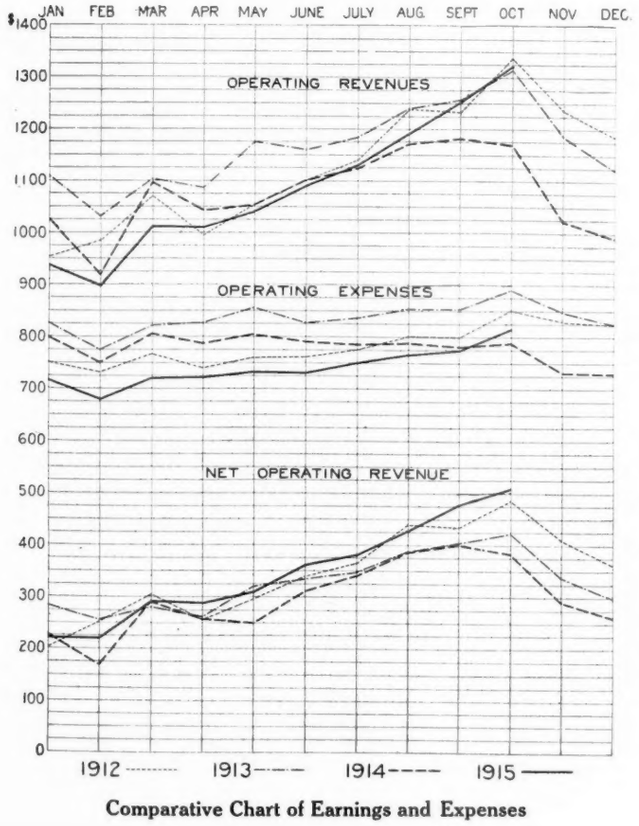
By Frank Haigh Dixon

Professor of Economics, Dartmouth College, Chief Statistician, Bureau of Railway Economics.

At the close of the year 1914 the Commission had just granted to the Eastern carriers an increase in rates as a result of the rehearing in the five-per-cent case. Many had hoped that this would furnish the necessary stimulus to pull business in general, and the railway business in particular, out of its slough of despond. But in spite of a marked revival in industrial activity, almost wholly due, I regret to admit, to the demands occasioned by the war, the railways for another six months remained quiescent and closed the fiscal year, on June 30, 1915, with a discouraging looking income account.

FRANK HAIGH DIXON
Professor of Economics, Dartmouth College

Table 1, based on the compilations of the Interstate Commerce Commission, shows the revenues and expenses in the aggregate and per mile for the fiscal years 1912 to 1915 of all railways having annual operating revenues of $1,000,000 or over, and includes about 90 per cent of the mileage of the country. The inclusion of the remaining 10 per cent of mileage, which unfortunately is unavailable, would reduce somewhat the per-mile figure, but would not disturb to any important degree the impression gained from a comparison of the items year by year. Total operating revenues show a falling off from the previous year of $165,000,000. While this decline on a per mile basis amounts only to 6.7 per cent as compared with 1914, it should be noted that this follows a decline of over $80,000,000 in gross earnings between 1913 and 1914. If the classification of railways by the commission made it possible to carry the per-mile figure for the "million dollar" roads back as far as 1910, it would be found that the per-mile figure of operating revenues for 1915 is smaller than in any year since 1909.



Comparative Chart of Earnings and Expenses

Upon a superficial examination, net earnings look better, but closer inspection shows that the slight increase in net, amounting per mile to 1.3 per cent over 1914, had no encouraging features about it. It was secured only by drastic cuts in the costs of operation, which have been practiced from the very beginning of this fiscal year, and which mean in large measure deferred expenditures that must be made good as soon as earnings permit. Taxes, for some unaccountable reason, did not increase during the year, but actually fell off 3.3 per cent per mile. The result is an increase of 2.1 per cent per mile in operating income, which, however, is 13.9 per cent below the figure for 1913 and 6 per cent below that for 1912.

Table II presents the financial experience for these railways by months for the complete calendar years 1912, 1913 and 1914, and for the ten months of 1915 for which data are available. For any revival in the carrying industry we look at once to the figures of gross earnings. Here the first six months tell the same story as do the final figures for the fiscal year just discussed—a decline month by month as compared with the corresponding month of 1914; and this, it should be recalled, was on top of a shrinkage in gross earnings in the previous year. In not one single month of 1914 did the operating revenues equal those of 1913. However, during these six months of 1915, the monthly decreases were growing smaller until finally they disappeared altogether, and in July were replaced by an increase of one-half of one per cent. This was the turning point, as it proved, and increases in gross have been steady and rapid in the three months since, amounting to 13 per cent in the per-mile figure for October as compared with the same month of 1914. Drastic cuts in operating expenses, which had been a feature of every month of the year 1914, continued throughout the first nine months of 1915. The effect on net earnings has been remarkable. Whereas in every month but one in 1914 net earnings per mile showed decreases as compared with 1913, beginning with February, 1915, there are increases per mile in net earnings in every month, which run all the way from 10.6 per cent in August to 32.3 per cent in October. The policy of retrenchment was yielding its results at last. As has already been intimated, this policy of economy can be pursued only so long as gross earnings compel it. It was therefore to be expected that when earnings took a turn for the better expenses would increase. October shows the beginning of this policy with an increase in expenses per mile of 3.6 per cent. That the railways must enter upon a period of more generous maintenance is everywhere recognized—in fact, contracts on a large scale have already been signed. But for many months ahead, the severe economies practiced in the last eighteen months should show their effects in considerable increases in net revenue.

The comparative chart of monthly revenues and expenses per mile reveals in a very striking fashion this movement which I have endeavored to describe. The 1914 operating revenues curve for the months of September to December drops far below those of 1912 and 1913. The curve representing 1915 starts below those of the previous three years, crosses 1912 in April, only to fall back again in May. In July it passes 1914, in September, 1912, in October, 1913, and fails to reach the highest point attained in the four years only because of an abnormal jump in earnings in October, 1912. The 1915 line of operating expenses remains below all the others until October, when it passes 1914. It has not yet reached the height attained by the curves of the other two years. The 1915 line of net revenue shows a steady gain over those of the three preceding years, being at a higher point than any of the others in April, June, July, September and October, and destined, it is hoped, to remain in its present relative position for many months to come.

Table III presents the per-mile figures of gross and net earnings and expenses for the three districts into which the country is divided for statistical purposes by the commission. The table covers the ten months of the calendar year 1915, and gives the percentage relation of the figures to the corresponding data for 1914. The purpose of this table is to analyze the material already presented, and to bring out any characteristic features peculiar to some one section of the country that might escape attention in aggregates for the United States as a whole. This analysis reveals the fact that recovery in gross revenues began much earlier in the East than in either of the other sections, due unquestionably to the stimulus given to manufacturing by the war orders of the allies. There has been an increase in gross revenues per mile in the Eastern district in every month since April, this increase growing steadily larger until it reached 17.1 per cent in October. In the other two districts the increase did not begin until September. In the movement of operating expenses, experience was similar in all three districts, decreases occurring in every month except October. But the decreases in the South were much larger than in either of the other two sections. In net revenue the East has made a striking showing. Every month has a substantial increase in its per-mile figure over the corresponding figure of 1914, October having a gain of 45.4 per cent. The February percentage of 81.8 per cent may be disregarded as abnormal. The month of February, 1914, yielded only $174 per mile of net revenue, which was a decline of 55.6 per cent from 1913. While this showing of net earnings in the East cannot be equalled either in the size or the uni-

Table I—Revenues and Expenses in the Aggregate and Per Mile of Line of Steam Roads Having Annual Operating Revenues of $1,000,000 or Over; Fiscal Years Ended June 30, 1915, 1914, 1913 and 1912

	1915		1914		1913		1912		Increase or decrease per mile of line 1915 over 1914		1913		1912	
	Amount	Per mile of line	Amount	Per mile of line	Amount	Per mile of line	Amount	Per mile of line	Amt.	Per Cent	Amt.	Per Cent	Amt.	Per Cent
Miles of line operated (average)	228,554	.....	225,478	.....	223,547	.....	219,666	.....	.....	....	.....	....	.....	....
Total operating revenues	$2,889,029,475	$12,641	$3,053,747,597	$13,543	$3,135,016,158	$14,024	$2,830,219,885	$12,884	d$902	d6.7	d$1,383	d9.9	d$243	d1.9
Total operating expenses	2,032,689,894	8,894	2,219,432,612	9,843	2,191,139,100	9,802	1,975,741,558	8,994	d949	d9.6	d908	d9.3	d100	d1.1
Net operating revenue	856,339,581	3,747	834,314,985	3,700	943,877,058	4,222	854,478,327	3,890	47	1.3	d475	d11.3	d143	d3.7
Taxes	133,993,519	586	136,612,209	606	123,655,189	553	116,418,825	530	d20	d3.3	33	6.0	56	10.6
Uncollectible railway revenue	640,345	3	.....	...	.....	.....	.....	.....	.....	....	.....	....	.....	....
Operating Income	721,705,717	3,158	697,702,776	3,094	820,221,869	3,669	738,059,502	3,360	64	2.1	d511	d13.9	d202	d6.0

d Decrease.

Table II—Monthly Revenues and Expenses Per Mile of Line: 1912, 1913, 1914 and 1915

	Operating Revenues per Mile					Operating Expenses per Mile					Net Operating Revenue per Mile				
				1915					1915					1915	
Month	1912	1913	1914	Amount	Per cent Increase or decrease from 1914	1912	1913	1914	Amount	Per cent Increase or decrease from 1914	1912	1913	1914	Amount	Per cent Increase or decrease from 1914
January	$953	$1,109	$1,026	$936	d 8.8	$751	$826	$799	$716	d 10.4	$202	$283	$227	$220	d 3.1
February	984	1,031	918	897	d 2.3	732	774	750	678	d 9.6	252	257	169	219	29.6
March	1,071	1,103	1,097	1,012	d 7.7	767	822	805	720	d 10.6	304	281	292	292	....
April	995	1,087	1,043	1,010	d 3.2	739	826	786	722	d 8.1	256	261	257	288	12.1
May	1,054	1,175	1,053	1,040	d 1.2	759	855	803	732	d 8.8	295	320	250	308	23.2
June	1,101	1,160	1,102	1,090	d 1.1	762	826	791	730	d 7.7	339	334	311	360	15.8
July	1,139	1,183	1,124	1,130	0.5	775	836	785	750	d 4.5	364	347	340	380	11.8
August	1,239	1,241	1,171	1,191	1.7	801	853	786	765	d 2.7	438	387	385	426	10.6
September	1,233	1,257	1,182	1,251	5.8	799	853	781	774	d 0.9	434	403	401	477	19.0
October	1,338	1,314	1,171	1,323	13.0	851	891	787	815	3.6	487	423	384	508	32.3
November	1,237	1,186	1,023	.....	....	829	848	732	...	...	408	338	292	...	...
December	1,184	1,122	990	.....	....	823	824	728	...	...	361	298	262	...	...

d Decrease.

Table III—Monthly Revenues and Expenses Per Mile of Line, January to October, 1915, by Districts

	Eastern District						Southern District						Western District					
	Operating Revenues		Operating Expenses		Net. Oper. Revenues		Operating Expenses		Operating Revenues		Net. Oper. Revenues		Operating Revenues		Operating Expenses		Net. Oper. Revenues	
Month of 1915	Amt. per mile	Per ct. inc. or dec. from 1914	Amt. per mile	Per ct. inc. or dec. from 1914	Amt. per mile	Per ct. inc. or dec. from 1914	Amt. per mile	Per ct. inc. or dec. from 1914	Amt. per mile	Per ct. inc. or dec. from 1914	Amt. per mile	Per ct. inc. or dec. from 1914	Amt. per mile	Per ct. inc. or dec. from 1914	Amt. per mile	Per ct. inc. or dec. from 1914	Amt. per mile	Per ct. inc. or dec. from 1914
January	$1,592	d 6.3	$1,285	d 9.8	$307	11.8	$793	d 15.0	$589	d 15.2	$204	d 14.3	$681	d 7.1	$495	d 7.4	$186	d 6.5
February	1,508	a	1,203	d 10.2	305	81.8	761	d 10.4	568	d 11.6	193	d 6.7	660	a	472	d 6.4	188	21.0
March	1,741	d 5.9	1,289	d 11.0	452	12.7	864	d 11.9	608	d 12.3	256	d 10.9	726	d 6.5	496	d 7.8	230	d 3.8
April	1,812	1.0	1,286	d 6.1	526	23.9	846	d 6.1	600	d 11.5	246	10.3	695	d 5.2	503	d 7.5	192	1.5
May	1,868	2.7	1,308	d 7.8	560	40.1	830	d 6.6	593	d 12.5	237	12.1	727	d 2.0	513	d 7.2	214	13.2
June	1,967	3.3	1,298	d 7.4	669	33.4	814	d 5.9	590	d 9.4	224	5.0	777	d 2.7	515	d 6.3	262	5.3
July	2,008	3.8	1,316	d 3.9	692	22.5	846	d 4.5	604	d 9.2	242	9.7	819	d 1.4	537	d 3.1	282	2.1
August	2,117	3.6	1,346	d 2.1	771	15.5	879	d 1.2	612	d 7.1	267	15.9	866	a	547	d 2.1	319	3.8
September	2,182	7.9	1,364	d 0.7	818	26.1	930	7.8	621	d 3.5	309	41.0	929	2.8	553	d 0.2	376	7.7
October	2,292	17.1	1,453	5.2	839	45.4	986	14.3	653	2.7	333	46.7	989	8.9	575	2.3	414	19.7

a Less than one-tenth of one per cent. d Decrease.

formity of the increase by the other districts, yet the latter have shown steady improvement since March. October yielded an increase per mile in the South of 46.7 per cent and in the West of 19.7 per cent.

One may safely prophesy that the year 1916 will show results far more agreeable to railway stockholders than have been realized in the past few years. The turning point seems to have been reached. However much we may deplore the occasion for our sudden awakening from our industrial lethargy, we must admit that it has enormously stimulated business and that its influence is being felt in industries and in sections remote from any connection with the European conflict. The commission has recognized the principle that the railways must have sufficient income to attract investors and to secure the capital necessary to maintain a standard of service demanded by the public. Such increases as the commission has granted will now do their part in increasing the fund of gross earnings. So far as reduction in expenses consists of deferred maintenance, it will mean only a temporary saving to the railways. But so far as the starvation period now passing away has developed more economical methods of operation and has reduced transportation expenses, it will represent a clear saving to the roads and a swelling of their net earnings. Their prosperity during the coming year depends in no small degree upon the manner in which expenses have been curtailed during the past two years.

DIVIDEND CHANGES

The accompanying table shows the changes in rates or in amounts declared of dividends of the railroads in the United States which made a change in 1915 as compared with 1914. The uncertainty of the first half of the calendar year and the increased business and brighter prospects of the second half of the year made the dividend changes very irregular.

Only such roads are included in the table where the total amount declared in 1915 was different than that in 1914. Thus, if a road deferred or omitted to pay a semi-annual dividend in the first half of the year 1915, but later declared the regular semi-annual dividend in the second half year and a dividend to correspond with the deferred or omitted dividend of the first half year, this road would not be included in the table.

DIVIDEND CHANGES

	Declared in 1915	Declared in 1914	Present annual rate	Annual rate in 1914
Alabama & Vicksburg	5	7	5	7
Baltimore & Ohio, common	5	6	5	6
Bangor & Aroostook	3	3½	[1]	..
Chesapeake & Ohio	None	3	..	..
Chicago Great Western, first preferred	1	None	4	..
Chicago, Milwaukee & St. Paul, common	4½	5	4	5
Detroit & Mackinac, common	None	5	..	5
Hocking Valley	1	7	..	7
Kanawha & Michigan	1¼	5	..	5
Louisville & Nashville	5	7	5	7
Michigan Central[2]	4	6	4	6
Nashville, Chatanooga & St. Louis	5	7	5	7
Pennsylvania Company	6	4	[3]	[3]
Pittsburgh, Cincinnati, Chicago & St. Louis	[4]			
Southern Railway, preferred	None	4½[5]	..	5
Toronto, Hamilton & Buffalo	None	4¾	..	6
Vicksburg, Shreveport & Pacific	None	5*	..	5
Wrightsville & Tennille	3	6	..	6

[1] Deferred.

[2] The company declares its dividend after the English methods out of earnings for certain periods, but in the table above the periods within which the dividends were declared are indicated, and the Michigan Central is made uniform with the other companies.

[3] The annual rate is not determinable.

[4] In December the directors declared 4 per cent on the preferred and 2 per cent on the common stock. The last previous dividend was 2½ per cent, declared in December, 1914, on the preferred, and ¾ per cent declared in March, 1915.

[5] Of the 4½ per cent dividends declared in 1914, 2 per cent was paid in 5-year 4 per cent interest bearing scrip.

ENLISTMENTS FROM THE NORTH-EASTERN RAILWAY OF ENGLAND.—The total number of employees of the North-Eastern Railway who had joined the colors up to November 22 was 9,179, or 16.85 per cent of the company's regular staff.

THE LABOR SITUATION

By W. L. STODDARD.

Washington, December 29.

The meager news which emanates from various quarters, chiefly from Chicago, concerning the great eight-hour day movement of the concerted railroad employees is causing considerable speculation here. The average congressman is, very likely, a resume of the salient ideas and theories which this correspon- ignorant of the situation, but Washington opinion is not wholly made up of congressmen's views. The following paragraphs are dent, for one, has been able to gather from more than a single source. While it is forbidden to mention names, it may be said that the general theme of this letter follows closely the thought of a government officer who is peculiarly well placed to speculate wisely:—

The gravity of the situation cannot be overestimated, and as time goes on the movement which has been started after months of more or less circumstantial rumor, grows more and more formidable. Eventually it will mean either a strike, the worst railroad strike in the history of the United States, or mediation. In case a strike should be called, it is expected that the public would step in, and the case then go to arbitration. But the men will avoid arbitration as long as possible, preferring to place their demands in the hands of a committee for the purpose of conferring or mediating with a committee of railroad officers.

The railroad employees appear to be little inclined to use the strike as a bluff—as has been done in the past. Brotherhood officers who are averse to striking are finding it difficult to talk down the idea of a strike—to make the men see that the strike should be used as a threat rather than as an actual implement wherewith to secure their demands.

The fact that the rank and file of the railroad employees appear to be getting impatient of the usual long-drawn-out arbitration proceedings is an important factor. It means that there are only two ways in which they may press for their demands: mediation or strike. The men seem to be in the mood for bargaining with the roads, provided the bargain can be of the short, direct, non-technical kind instead of the elaborately documented court proceedings of the usual arbitration case. As the situation "sizes up" today, the last resort of the brotherhoods in their fight for an eight-hour day will be forced arbitration growing out of an actual strike of some days' duration.

The seriousness of this situation is still evidently unappreciated by the public and by many railroad men—both employees and employers. The organized and industrial unionized movement for an eight-hour day has been a long time coming, but apparently it is surely approaching a climax. The moral effect of this great movement, say my informants, is bound to be far-reaching irrespective of the immediate outcome. And, by the same token, the manner in which both the men and the roads handle themselves and the case will be of the utmost significance in future railroad wage controversies—for, boiled down to dollars and cents, the fundamental question is one of wages for overtime. It is partly a question of machinery, but to a large extent a question of attitude and temper. On the answer made to these questions depends the further question of whether there will be an actual strike or not.

ELECTRIFICATION IN BRITAIN.—At the end of 1913 there were 83 electric locomotives in use on British railways, of which 52 were on the City & South London, and 21 on the Metropolitan. There were at the same period 1,019 electric motor vehicles with a total seating capacity of 51,219, and 1,467 electric trailer cars with a seating capacity for 77,297. All the electric locomotives and the trailer cars, and also all the motor vehicles except 13 cars, seating 742 passengers, in Ireland, are in England. In addition to these there were 214 steam rail motors, seating 11,078 passengers. Four, seating 145, were in Scotland; six, seating 242, in Ireland, and the remainder in England and Wales.

Cars and Locomotives Ordered and Built in 1915

Year Signalized by Extension of All-steel Equipment, Foreign Orders and Rush of Business in Last Quarter

The railways, the private car lines and other users of cars and locomotives in the United States, Canada and Mexico have during 1915 placed orders for or authorized the construction of 107,796 freight cars, 3,092 passenger cars and 1,573 locomotives.* The supply companies of this country and Canada have at the same time, however, received orders from foreign countries, notably Russia and France for at least 18,222 freight cars and 850 locomotives. The domestic orders this year show a substantial increase over those of 1914 when 80,264 freight cars, 2,002 passenger cars and 1,265 locomotives were ordered, but they are small compared with the figures for 1905 when 341,315 freight cars, 3,289 passenger cars and 6,265 locomotives were ordered.

During 1915 there have been built in the plants of the car and locomotive builders 74,112 freight cars, 1,949 passenger cars and 2,085 locomotives. Although these totals include a fair proportion of foreign orders, they are much below the totals for 1914, the output for cars in fact being the smallest reported by this paper since 1904, and that of locomotives the smallest since 1898.

On the following pages are shown detailed lists of the freight cars, passenger cars and locomotives ordered by the railways, private car lines and industrial companies of the United States, Canada and Mexico. Every effort has been made to make these tabulations as complete as possible, but it will be found that the orders shown do not add up to as great amounts as the totals given in the several tables, there having been orders placed (as reported by the equipment builders) for 1,830 tank cars, 85 miscellaneous freight cars, and 88 small locomotives concerning which it was impossible to obtain detailed information. Although even with this there may be some omissions of domestic orders, the results are sufficiently accurate to meet the general purpose for which these statistics are prepared, namely, to show the character and extent of the purchases of motive power and rolling stock this year as compared with last.

Tables are also given, showing the foreign orders for cars and locomotives. While it is not likely that these tables are complete it is probable that they include at least nine-tenths of the foreign orders received and certainly all of the important ones.

The information given herewith is compiled from official sources. The *Railway Age Gazette* in answer to its inquiries received communications this year from all but two of the railways in the United States and Canada owning over 500 cars. It also heard from the greater part of the remaining roads and from most of the private car lines owning over 100 cars. In the case of foreign orders, and where no replies were received, from the railways here, the details were taken from the weekly records or from the reports of the builders.

* It will be understood that these totals include only those orders for cars and locomotives which came to our attention up to the time of going to press, Wednesday evening, December 29. If other orders, placed before the end of the year, are reported later, the items will appear in the Equipment and Supplies column in the General News Section in next week's issue and revised totals will be given in that column.

TABLE I. CARS AND LOCOMOTIVES ORDERED DURING PAST 15 YEARS

Year.	Locomotives.	Cars—Passenger.	Cars—Freight.	Year.	Locomotives.	Cars—Passenger.	Cars—Freight.
1901	4,340	2,879	193,439	1908	1,182	1,319	62,669
1902	4,665	3,459	195,248	1909	3,350	4,514	189,360
1903	3,283	2,310	108,936	1910	3,787	3,881	141,204
1904	2,538	2,213	136,561	1911	2,850	2,623	133,117
1905	6,265	3,289	341,315	1912	4,515	3,642	324,758
1906	5,642	3,402	310,315	1913	3,467	3,179	146,732
1907	3,482	1,791	151,711	1914	1,265	2,002	80,264
				1915	1,573	3,092	107,796

TABLE II
CLASSIFICATION OF LOCOMOTIVES ORDERED DURING THE LAST FIVE YEARS

	1915	1914	1913	1912	1911
Mikado	562	333	796	1,309	590
Switching	221	201	638	821	443
Consolidation	194	166	823	858	577
Mallet	120	59	72	168	112
Pacific	102	174	566	594	486
Santa Fe	75	63	...	.....	...
Ten-wheel	39	48	255	364	238
Mogul	12	24	42	61	127
Mountain	9	12	24	.....	2
Atlantic	1	34	46	5	9
American	1	19	8	8	27
Electric	69	59	94	75	133
Other	168	73	103	252	406
Total	1,573	1,265	3,467	4,515	2,850

TABLE III. FREIGHT AND PASSENGER CARS BUILT EACH YEAR SINCE 1899

Year.	Freight.	Passenger.	Total.
1899	119,886	1,305	121,191
1900	115,631	1,636	117,267
1901	136,950	2,055	139,005
1902	162,599	1,948	164,547
1903	153,195	2,007	155,202
1904	60,806	2,144	62,950
1905*	165,155	2,551	168,006
1906*	240,503	3,167	243,670
1907*	284,188	5,457	289,645
1908*	76,555	1,716	78,271
1909*	93,570	2,849	96,419
1910*	180,945	4,412	185,357
1911*	72,161	4,246	76,407
1912†	152,429	3,060	155,489
1913†	207,684	3,296	210,980
1914†	104,541	3,691	108,232
1915†	74,112	1,949	76,061

* Includes Canadian output.
† Includes Canadian output and equipment built in railroad shops.

TABLE IV. LOCOMOTIVES BUILT FOR EVERY YEAR SINCE 1893

Year.	No. Built.	Year.	No. Built.	Year.	No. Built.
1893	2,011	1901	3,384	1908*	2,342
1894	695	1902	4,070	1909*	2,887
1895	1,101	1903	5,152	1910*	4,755
1896	1,175	1904	3,441	1911*	3,530
1897	1,251	1905*	5,491	1912†	4,915
1898	1,875	1906*	6,952	1913†	5,332
1899	2,475	1907*	7,362	1914†	2,235
1900	3,153			1915†	2,085

* Includes Canadian output.
† Includes Canadian output and equipment built in railroad shops.

TABLE A—CLASSIFICATION OF FREIGHT CARS ORDERED DURING 1915

	All Steel a	Steel Frame and steel underframe c	Steel underframe b	Composite underframe d	Wood f	Not specified	Total	Draft Gear: Spring m	Draft Gear: Friction n	Draft Gear: Not specified
Box	11,005	14,945	11,377	1,225	601	1,850	41,303	14,852	24,225	2,226
Refrigerator	224	100	3,619	.....	...	550	4,493	2,069	1,874	550
Hopper, including ore	27,548	8	.....	.....	10	906	28,472	1,016	26,537	919
Gondola	9,337	7,845	2,515	150	...	500	20,347	8,759	10,538	1,050
Coal (not otherwise specified)	1,000	.....	.....	.....	...	600	1,600	.....	1,000	600
Stock	.....	510	1,500	300	...	10	2,320	1,050	1,260	10
Flat	1,047	.....	.....	6	104	95	1,252	107	892	253
Tank	5,881	.....	.....	.....	...	186	6,067	50	4,045	1,972
Caboose	120	20	145	27	...	50	362	27	260	75
Miscellaneous or not specified	551	340	244	.....	10	435	1,580	121	991	468
Total	56,713	23,768	19,400	1,708	725	5,482	107,796	28,051	71,622	8,123

The remarkable feature in this year's records has been the revolutionary change in business activity since October 1. Our records show that the first half of the year, as far as the equipment market was concerned, was exceedingly dull, and that scarcely more than one-third of the orders for the year were placed before July 1. The last four months have been exceptionally prosperous, and it is worthy of note that approximately half the year's orders have been placed since October 1. The year will also be remembered for the enormous increase of business with railways of foreign countries.

Of the 107,796 freight cars ordered this year only 725 are specified as being of wood, and only 1,708 as having composite underframes. There has been a very decided increase in cars of all-steel and steel frame construction, but the cars with steel underframes only are but little more than half those of last year. This is shown in the case of the box cars particularly, the number of all-steel box cars having increased over four times.

Concerning passenger cars, it is noticeable that by far the larger proportion of the equipment is of all-steel construction and provided with electric lighting.

Of the total of 1,573 locomotives ordered, 1,174 are specified as being equipped with superheaters, and 919 as being provided with brick arches.

The returns relating to equipment built in 1914 have come from builders in both the United States and Canada, and, as usual, the output of railway shops is also included. Of the total of 74,112 freight cars built, 59,984 were on domestic, and 14,128 on foreign orders. In like manner, 39,783 were specified as being of all-steel construction, 27,887 as having steel underframes, and only 4,432 as being of wood. The construction of the remaining 2,010 was not specified. These figures for freight cars built do not show the great amount of repair work done, or the large number of steel underframes constructed for installation on old wooden cars. The economies forced upon the carriers by the late depression made this a big business this year, and a number of builders did no other work.

The total of 1,949 passenger cars built includes 1,935 for domestic uses, and only 14 for export. Nearly all the cars were of all-steel construction, 1,898 being so specified, 40 as having steel underframes, and 11 as being of wood. The total of 2,085 locomotives built includes 1,250 for domestic uses, and 835 for export abroad.

It is the consensus of opinion that the prosperity which the railway supply field is now enjoying will extend well over into the coming year. A number of companies have sufficient orders on hand at present to keep them busy for a number of months. Some report orders on hand at the close of the year from three to ten times as great as were waiting to be filled at this time last year.

TABLE B—CLASSIFICATION OF PASSENGER CARS ORDERED DURING 1915

	All Steel a	Steel underframe b	Composite underframe d	Wood f	Not specified	Total	Method of Lighting: Electric x	Gas y	Electric and gas xy	Oil w	None	Not specified
Coaches and smoking, including combination coach and smoking	1,771	7	..	..	...	1,778	1,763	13	..	..	...	2
Parlor and chair	83	..	..	..	...	83	80	..	2	..	...	1
Sleeping	473	..	..	..	...	473	466	..	7	..	...	
Dining	35	..	..	..	...	35	31	..	..	..	...	4
Comb. passenger and baggage	90	1	..	1	...	92	86	5	..	..	...	1
Baggage	245	1	..	..	...	246	200	31	..	..	...	15
Comb. baggage and mail	116	..	..	..	...	116	103	13	..	..	...	..
Mail	40	..	..	..	...	40	21	16	..	..	...	3
Gas-electric and gasolene	10	..	..	..	...	10	7	..	..	..	...	3
Miscellaneous	11	85	23	..	100	219	10	3	..	1	105	100
Total	2,874	94	23	1	100	3,092	2,767	81	9	1	105	129

FREIGHT CARS ORDERED IN 1915

Purchaser	No.	Kind		Builder
Alabama & Vicksburg	cn 60	Gondola	80,000	Am. C. & F.
	cn 11	Tank	80,000	Am. C. & F.
Alberta & Gt. Waterways	fm 50	Box	60,000	Can. C. & F.
Am. Cotton Oil Co.	an 148	Tank	8,050 g.	Ralston
American Linseed Co.	an 10	Box	60,000	Am. C. & F.
Am. Refrig. Transit Co.	bm 16	Refrig.	60,000	Am. C. & F.
Am. Sheet & Tin Plate Co.	6	Tank		Ger. Am.
Am. Steel & Wire Co.	an 50	Tank	100,000	Ger. Am.
American Zinc Co.	a 25	Tank	100,000	Am. C. & F.
Anaconda Copper Co.	an 22	Ore	120,000	Mt. Vernon
	an 100	Hopper	100,000	West. Steel
Anaconda Copper Min. Co.	an 6	Concentrate	120,000	Mt. Vernon
	an 14	Dump	100,000	Pullman
	am 6	Concentrate	100,000	Cambria
	am 2	Hopper	100,000	Cambria
Anglo - Newfoundland Dev. Co.	cm 12	Box	40,000	Eastern Car
Atchison, Top. & S. Fe.	bn 700	Box	80,000	Has. & Bar.
	bn 500	Refrig.	60,000	Am. C. & F.
	an 25	Flat	80,000	Am. C. & F.
	an 25	Ore	100,000	West. Steel
	an 25	Concen.	100,000	Pullman
	cn 500	Stock	80,000	Pullman
	an 400	Tie	80,000	Has. & Bar.
	an 100	Tank	80,000	Press. Steel
	an 25	Concentrate	100,000	Pullman
Atlantic Coast Line	an 50	Flat	60,000	Co. shops
	an 10	Flat	80,000	Co. shops
	an 200	Flat	80,000	Am. C. & F.
	bn 750	Box	60,000	Mt. Vernon
Atlas Car Co.	am 15	Tank	8,000 g.	Chgo. Car
	an 15	Tank	8,000 g.	Ger. Am.
Baltimore & Ohio	bn 1006	Box	80,000	Mt. Vernon
	an 2000	Hopper	110,000	Cambria
	an 600	Hop. bod.	105,000	Am. C. & F.
	an 400	Hop. bod.	105,000	Ralston
	an 910	Hop. bod.	105,000	Std. Steel
	an 200	Hop. bod.	105,000	Greenville
	an 300	Hop. bod.	105,000	Press. Steel
	bn 500	Box bod.	80,000	Std. Steel
Bangor & Aroostook	an 125	Flat	80,000	Std. Steel
Barrett Mfg. Co.	an 1	Tank	6,233g.	Ger. Am.
	an 1	Tank	6,231g.	Ger. Am.
	an 1	Tank	5,810g.	Ger. Am.
	an 1	Gondola	100,000	West. Steel
Berlin Mills	an 3	Flat	100,000	Press. Steel
Bethlehem Chile Iron Mines	an 1	Flat	40,000	Laconia
Boston Elevated	am 3	Dump	40,000	Universal
Buckhannon Chemical Co.	f 6	Logging		Russel W. & F.
Butte, Anaconda & Pac.	an 100	Ore	100,000	West. Steel
California Dispatch Line.	an 5	Tank	80,000	Ger. Am.
Calumet & Hecla Min. Co.	cm 5	Hopper	100,000	West. Steel
Campbell's Creek	bm 100	Gondola	80,000	Am. C. & F.
Canadian Govt. Rys.	am 250	Gondola	100,000	Eastern Car
	bm 500	Box	80,000	Can. C. & F.
	bm 150	Box	80,000	Can. C. & F.
Canadian Pacific	800	Box		Co. shops
	250	Refrig.		Co. shops
Capitol Refining Co.	a 25	Tank	80,000	Am. C. & F.
Car., Clinchfield & Ohio.	1	Concrete mixing.		McKeen
Carnegie Steel Co.	am 3	Tank	60,000	Press. Steel
Central of Georgia	bn 500	Box	80,000	Pullman
	bn 500	Vent. box	80,000	Am. C. & F.
Central of New Jersey	an 1000	Hopper	110,000	Std. Steel
	an 1000	Hopper	110,000	Press. Steel
	cn 500	Box	80,000	Std. Steel
	cn 500	Box	80,000	Am. C. & F.
	bn 250	Ins. Box.	80,000	Am. C. & F.
Central Steel Co.	1	Dump	20 yds.	Clark Car
Champion Lbr. Co.	35	Logging	60,000	Magor
Chesapeake & Ohio	an 1000	Coal	140,000	Std. Steel
	1000	Box	60,000	Central Loco.
	50	Caboose		Am. C. & F.
	an 10	Gon. bod.	115,000	Press. Steel
Chicago & Alton	dn 150	Gondola	80,000	Has. & Bar.
Chicago & North Western	cn 2000	Box	80,000	West. Steel
	an 500	Ore	100,000	Am. C. & F.
	bn 50	Caboose		Am. C. & F.
	250	Ore		Am. C. & F.
Chic. Burlington & Quin.	cm 1000	Box	80,000	Bettendorf
	cm 1000	Box	80,000	Am. C. & F.
Chicago Great Western	an 2	Air dump	20 yds.	Kil. & Jac.
Chic., Milwaukee & St. P.	500	Ore	120,000	Co. shops

Purchaser	No.	Kind		Builder
Chic. Rock Island & Pac.	cn 2500	Box	80,000	Pullman
	cn 1000	Box	80,000	Bettendorf
	cn 500	Box	80,000	Has. & Bar.
Chic. St. Paul, Minn. & Omaha	bn 100	Refrig.	60,000	Has. & Bar.
	cn 750	Box	80,000	Has. & Bar.
	cn 750	Box	80,000	Am. C. & F.
	cn 300	Auto.	80,000	Am. C. & F.
Chili Exploration Co.	an 40	Ore	120,000	Press. Steel
Cin., Hamilton & Dayton	am 2	Gondola	100,000	Cambria
Cin., Indianapolis & West.	bn 450	Box	80,000	Has. & Bar.
	bn 50	Stock	80,000	Has. & Bar.
	an 40	Flat	80,000	Has. & Bar.
	bn 50	Gondola	100,000	Has. & Bar.
	an 50	Hopper	100,000	Has. & Bar.
	dn 20	Caboose		Has. & Bar.
Cincinnati Northern	bm 500	Auto.	80,000	Am. C. & F.
Cleve. Cliffs Iron Co.	6	Ore		Cambria
Coal & Coke	100	Coal		Co. shops
Constantine Refining Co.	a 20	Tank	80,000	Am. C. & F.
Consumers Refining Co.	an 6	Tank	10,000 g.	Kennicott
Copper Range	an 50	Ore	100,000	Press. Steel
Cosden & Co.	a 50	Tank	100,000	Am. C. & F.
	a 30	Tank	80,000	Am. C. & F.
	a 20	Tank	60,000	Am. C. & F.
Coulbourn Bros.	f 10	Logging	20,000	Russel W. & F.
Craig Oil Co.	an 5	Tank	60,000	Am. C. & F.
Crystal Car Line	an 35	Tank	100,000	Am. C. & F.
	an 50	Tank	100,000	Ger. Am.
Cushing Ref. Co.	a 50	Tank	80,000	Am. C. & F.
Dave Lbr. Co.	f 5	Logging	30,000	Russel W. & F.
	f 10	Logging	30,000	Russel W. & F.
Delaware & Hudson	an 2	Gun	200,000	Press. Steel
	fm 1	Snow plow		Russel S. P.
	fm 6	Flanger		Russel S. P.
Del. Lack. & Western	dn 5	Caboose		Co. shops
	an 500	Hopper	100,000	Am. C. & F.
	bn 1000	Box	80,000	Am. C. & F.
	cn 300	Gondola	80,000	Bar. & Smith
	200	Gondola		Std. Steel
Delray Connecting	an 12	Hopper	150,000	Am. C. & F.
Dept. of Rys. & Canals (Can.)	fm 6	Platform	30,000	Can. C. & F.
Detroit & Mackinac	b 2	Dump	10 yds.	Russel W. & F.
Detroit, Toledo & Ironton	cn 100	Box	80,000	Am. C. & F.
	cn 100	Auto.	80,000	Am. C. & F.
Diamond Alkali Co.	am 1	Tank	100,000	Press. Steel
Dominion Coal Co.	fm 1	Flanger		Can. C. & F.
Duluth & Iron Range	an 250	Ore	100,000	Am. C. & F.
	an 500	Ore	100,000	Std. Steel
	an 100	Flat	60,000	Am. C. & F.
Duluth, Missabe & No.	an 1000	Ore	100,000	West. Steel
	an 200	Hopper	100,000	Pullman
East Broad Top	an 5	Box	60,000	Co. shops
	an 25	Hopper	70,000	Co. shops
East Jersey R. R. & Term.	a 15	Tank	80,000	Am. C. & F.
	a 19	Tank	100,000	Am. C. & F.
	a 20	Tank	80,000	Am. C. & F.
East Tenn. & W. No. Car.	f 10	Hopper	60,000	Co. shops
Edison Illuminating Co.	an 2	Gondola	100,000	Press. Steel
Edmonton, Dunvegan & B. C.	10	Stock		Nat. Steel
	fm 50	Box	60,000	Can. C. & F.
El Paso & So.-western	an 50	Ore	100,000	Press. Steel
Emlenton Ref. Co.	100	Gondola		Am. C. & F.
Erie	bn 500	D. E. Gon.	110,000	Std. Steel
	b 500	Gondola	110,000	Am. C. & F.
	an 1000	Gondola	100,000	Press. Steel
	a 104	Tank	100,000	Am. C. & F.
	am 1	Tank	80,000	Press. Steel
Etna Explosives	am 6	Tank	60,000	Press. Steel
Fairport, Painesville & E.	60	Logging	80,000	Magor
Falling Rock Cannel Coal Co.	am 2	Tank	60,000	Press. Steel
Finkbine Lbr. Co.	bn 500	Box	60,000	Has. & Bar.
Forbes, W. S., & Co.				
Ft. Dodge, Des Moines & So.				
Fort Worth & Denver City	dm 1200	Box	80,000	Has. & Bar.
	dm 300	Stock	80,000	Has. & Bar.
	am 200	Gondola	100,000	Has. & Bar.
Freeport & Mex. Fuel Oil Corp.	a 100	Tank	100,000	Am. C. & F.
Ga. Southern & Fla.	bn 375	Vent. box	60,000	Lenoir
	an 130	Gondola	80,000	Lenoir
General Equipment Co.	am 2	Tank	60,000	Press. Steel
	an 4	Hopper	100,000	Press. Steel
Grand Rapids & Ind.	an 200	Box	100,000	Has. & Bar.
Great Lakes Lime Stone & Chem. Co.	b 30	Dump	10 yds.	Russel W. & F.
Great Northern	fm 500	Box	80,000	Has. & Bar.
Greater Winnipeg Waterways Ry.	bm 12	Dump	6 yds.	Can. C. & F.
	cm 40	Dump	20 yds.	Can. C. & F.
Green Bay & Western	bn 100	Box	80,000	Has. & Bar.
Grey Bull Ref. Co.	a 50	Tank	80,000	Am. C. & F.
Gulf Refining Co.	a 100	Tank	80,000	Am. C. & F.
Harrison Bros. & Co.	a 21	Tank	100,000	Am. C. & F.
Hart-Otis Car Co.	am 6	Gen. serv.	100,000	Can. C. & F.
Hebard Cypress Co.	f 15	Logging	50,000	Russel W. & F.
Hopkins, F. H., Co., Ltd.	fm 2	Lidgerwood unloader	60,000	Can. C. & F.
	am 1	Flat	100,000	Can. C. & F.
	am 1	Flat	100,000	Can. C. & F.
Illinois Central	bm 1000	Refrig.	60,000	Am. C. & F.
	bm 900	Refrig.	60,000	Am. C. & F.
	am 100	Gondola	100,000	Am. C. & F.
	40	Dump		West. Wh.
Illinois Steel Co.	a 10	Tank		Am. C. & F.
Illinois Traction Sys.	b 50	Gondola		Has. & Bar.
Imperial Oil Co., Ltd.	an 235	Tank		Co. shops
Indian Refining Co.	an 5	Tank	80,000	Chgo. Steel

Purchaser	No.	Kind		Builder
Intercolonial	am 5	Snow plow		Can. C. & F.
	350	Box	80,000	Nat. Steel
Intermountain	an 10	Logging	70,000	Magor
International Agric. Corp.	a 20	Tank	100,000	Am. C. & F.
International & Great Northern	bn 200	Stock	60,000	Mt. Vernon
	cn 500	Box	80,000	Mt. Vernon
	cn 300	Ballast	100,000	Mt. Vernon
International Smelting Co.	an 4	Hopper	120,000	Mt. Vernon
Interstate	a 10	Flat bod.	80,000	Mt. Vernon
Isle Royle Copper Co.	cm 3	Hopper	100,000	Press. Steel
Jane Oil & Gas Co.	a 20	Tank	60,000	Am. C. & F.
	a 30	Tank	100,000	Am. C. & F.
Jones & McLaughlin	20	Hopper	100,000	Clark Car
Kalbfleisch, F. H., Co.	an 1	Tank	80,000	Erie
Kansas Oil Ref. Co.	a 36	Tank	80,000	Am. C. & F.
	a 12	Tank	100,000	Am. C. & F.
	a 12	Tank	60,000	Am. C. & F.
Keith Car Co.	an 155	Tank	10,000 g.	Am. C. & F.
	an 197	Tank	8,000 g.	Am. C. & F.
	an 13	Tank	6,000 g.	Am. C. & F.
Kennicott Co.	an 23	Tank	8,000 g.	Kennicott
La Belle Iron Works	an 5	Flat	200,000	Ralston
Lake County Gravel Co.	an 1	Sand	100,000	Summers
	am 1	Sand	100,000	Summers
L. E. Franklin & Clarion	an 32	Hopper	100,000	Am. C. & F.
Lake Sup. & Ishpeming.	an 406	Hopper	100,000	Cambria
Lehigh & Hudson River.	an 25	Ore	100,000	Am. C. & F.
Lehigh Valley	b 25	Caboose		Am. C. & F.
London & Port Stanley.	f 1	Box		Preston
Long Island	bn 100	Box	100,000	Press. Steel
	bn 100	Long gon	100,000	Press. Steel
Louisiana & Arkansas.	an 1	Tank	10,000 g.	Am. C. & F.
Louisiana Ry. & Nav.	an 30	Tank	8,000 g.	Ger. Am.
	an 50	Flat	60,000	Am. C. & F.
Louisville & Nashville	bm 1000	Box	80,000	Co. shops
	bm 400	Gondola	100,000	Co. shops
Lyon Cypress Lbr. Co.	am 75	Logging	75,000	Bettendorf
Mather Stock Car Co.	bn 500	Stock	80,000	Has. & Bar.
Marsch, John	am 5	Flat	80,000	Press. Steel
McCave Chemical Co.	a 75	Tank	100,000	Am. C. & F.
Mex. Petroleum Co.	a 120	Tank	100,000	Am. C. & F.
Michigan Alkali Co.	an 50	Hopper	100,000	Press. Steel
Michigan Central	am 500	Auto.	100,000	Has. & Bar.
	am 500	Auto.	100,000	Has. & Bar.
	cm 500	Gondola	110,000	Std. Steel
	am 1500	Auto.	100,000	Has. & Bar.
	am 1000	Auto.	100,000	Am. C. & F.
	am 1000	Auto.	100,000	Pullman
Mil. Refrig. Tran. & Car Co.	bm 3	Refrig.	60,000	Mil. Ref.
Miller, T. R., Mill Co.	a 20	Logging	60,000	Mt. Vernon
Mineral Point Zinc Co.	an 55	Tank	100,000	Ger. Am.
Minneapolis & St. Louis.	cn 500	Box	80,000	Bettendorf
Minn., St. Paul & Sault Ste Marie	cn 400	Box	80,000	Am. C. & F.
	cn 100	Auto.	80,000	Am. C. & F.
	an 200	Ore	100,000	Am. C. & F.
Minn., St. P., Roch. & Dubuque	bm 45	Box	80,000	J. G. Brill
Missouri, Kan. & Tex.	bn 80	Box	60,000	Co. shops
	bn 200	Ballast	100,000	Am. C. & F.
Morrell Refrig. Line.	bm 100	Refrig.	60,000	Am. C. & F.
Morris & Co. Refrig. Line	bn 450	Refrig.	60,000	Has. & Bar.
Morris & Co. Tank Line.	an 20	Tank	80,000	Chgo. Steel
Moose Mountain, Ltd.	am 3	Flat	80,000	Can. C. & F.
Nash., Chattanooga & St. Louis	cn 20	Caboose		Co. shops
	cm 200	Box	80,000	Co. shops
	cn 800	Box	80,000	Co. shops
	1	Dynamometer		Burr Co.
Nevada Northern	an 50	Dump	100,000	Pullman
New Orleans & Northeastern	cn 150	Box	60,000	Am. C. & F.
	cn 34	Gondola	80,000	Am. C. & F.
New York Central	bm 500	Auto.	80,000	Am. C. & F.
	bm 500	Auto.	80,000	Bar. & Smith
	cm 500	Gondola	110,000	Press. Steel
	cm 500	Gondola	110,000	Std. Steel
	cm 1000	Gondola	110,000	Std. Steel
	cm 2000	Gondola	110,000	Std. Steel
	am 500	Auto.	100,000	Has. & Bar.
	am 1000	Auto.	100,000	Am. C. & F.
	am 500	Auto.	100,000	Am. C. & F.
New Haven Trap Rock Co.	an 6	Hopper	100,000	Ralston
N. J. Zinc Co.	an 10	Gondola	100,000	Press. Steel
	10	Hopper		Std. Steel
	an 11	Hopper	100,000	Press. Steel
Newport News S. B. & D. D. Co.	dm 2	Flat	100,000	Cambria
	dn 4	Flat	100,000	Cambria
N. Y., N. H. & H.	500	Coal		Std. Steel
N. Y. Ontario & Western	am 20	Caboose		Co. shops
	an 400	Hopper	100,000	Cambria
	100	L. s. gon		Am. C. & F.
N. Y., Phila. & Norfolk	bn 76	Box	100,000	Am. C. & F.
	b 50	Box		Am. C. & F.
Norfolk & Western	bn 65	Cabin		Co. shops
	am 50	Dump	16 yds.	Kil. & Jacobs
	an 1000	Gondola	180,000	Co. shops
Norfolk Southern	an 24	Ballast	100,000	Am. C. & F.
	a 1	Plow car		Am. C. & F.
No. American Car Co.	an 150	Tank	100,000	Am. C. & F.
	an 8	Tank	8,000 g.	Kennicott
Oregon Short Line	bm 750	Stock	80,000	Has. & Bar.
Penick & Ford Tank Line	a 100	Tank	100,000	Am. C. & F.
Peninsular	am 10	Logging	80,000	Seattle

Purchaser	No.	Kind		Builder
Pennsylvania R. R.....	an 1000	Box	100,000	Altoona Shops
	an 622	Long gon.	140,000	Altoona Shops
	an 100	Cabin	...140,000	Altoona Shops
	an 95	M.W.Flat	100,000	Altoona Shops
	an 94	M.W.Flat	100,000	Altoona Shops
	an 2	Flat	150,000	Altoona Shops
	an 2	Spec. flat.	150,000	Altoona Shops
	an 3000	Hop. gon.	140,000	Cambria
	an 300	Box	100,000	Cambria
	an 1719	Hop. gon.	140,000	Am. C. & F.
	an 973	Long. gon	140,000	Am. C. & F.
	an 400	Box	100,000	Am. C. & F.
	an 224	Refrig.	.. 90,000	Am. C. & F.
	an 453	Long. gon	140,000	Press. Steel
	an 20	Box	100,000	Press. Steel
	an 200	Hop. gon.	140,000	Std. Steel
Pennsylvania Lines West	cn 100	Refrig.	.. 90,000	Am. C. & F.
	an 1000	Gondola	..140,000	Am. C. & F.
	an 1500	Gondola	..140,000	Press. Steel
	an 1150	Gondola	..140,000	Has. & Bar.
	an 1000	Box	100,000	Has. & Bar.
	an 1000	Auto.	...100,000	Has. & Bar.
	an 1000	Hopper	..140,000	Ralston
	an 800	Hopper	..140,000	Std. Steel
	an 500	Hopper	..140,000	Press. Steel
Phelps, Dodge & Co....	an 50	Ore	100,000	West. Steel
Philadelphia & Reading..	bgn 1000	Box	 85,000	Am. C. & F.
	an 1000	Hopper	..110,000	Press. Steel
	bn 500	H. S. Gon.	100,000	Std. Steel
	an 500	Hopper	..110,000	Std. Steel
	an 200	Hop. bod.	100,000	Am. C. & F.
	an 200	Hop. bod.	100,000	Am. C. & F.
	an 200	Hop. bod.	100,000	Am. C. & F.
	bn 100	Box	 80,000	Am. C. & F.
Phila., Balt. & Wash...	an 322	Long gon.	140,000	Altoona Shops
	an 10	M. W. flat	100,000	Altoona Shops
	an 250	Box	100,000	Press. Steel
	an 47	Long gon.	140,000	Press. Steel
	an 14	Long gon.	140,000	Am. C. & F.
Pittsburgh Cruc. Steel Co.	am 18	Flat	200,000	Press. Steel
Pitts. & Lake Erie.....	cm 1000	Gondola	..110,000	Std. Steel
	cm 1000	Gondola	..110,000	Press. Steel
	cm 1000	Gondola	..110,000	Std. Steel
	am 1000	Hopper	..110,000	Std. Steel
Pittsburgh Steel Co.....	10	Hopper	.....	Std. Steel
Ponca Refining Co.....	120	Tank	.....	Am. C. & F.
Poulson Logging Co.....	a 30	Logging	. 80,000	Russel W. & F.
Proctor & Gamble Co...	am 1	Gondola	.100,000	Press. Steel
Producers Ref. Co.....	a 100	Tank	... 80,000	Am. C. & F.
Prudential Oil Corp.....	an 50	Tank	... 60,000	Am. C. & F.
	an 120	Tank	... 80,000	Am. C. & F.
	an 30	Tank	...100,000	Am. C. & F.
	50	Tank	.....	Am. C. & F.
Quanah, Acme & Pacific	b 25	Box	 80,000	Mt. Vernon
Raritan River	bn 15	Gondola	..100,000	Std. Steel
Ray Cons. Copper Co...	an 20	Ore	120,000	Press. Steel
Richardson & Avery....	f 35	Logging	. 50,000	Russel W. & F.
St. Louis Refrig. Car Co	bm 50	Refrig.	... 60,000	Co. shops
St. Louis, Troy & Ea....	bm 300	Gondola	.100,000	Am. C. & F.
Sandy Valley & Elkhorn	an 1500	Hopper	..110,000	Cambria
	an 1000	Hopper	..110,000	Am. C. & F.
	an 500	Hopper	..110,000	Press. Steel
San Pedro, Los Ang. & Salt Lake.....	bm 5	Caboose	.....	Pullman
Smethport Extract Co...	a 17	Tank	...100,000	Am. C. & F.
South Dakota Central..	dm 25	Box	 60,000	Central Loco.
	dm 2	Caboose	.....	Central Loco.
Southern	2	Dynamometer	...	Lenoir-Burr
Southern Extract Co....	10	Tank	.....	Am. C. & F.
Spang, Chalfant & Co...	an 10	Flat	150,000	Cambria
	an 5	Gondola	.100,000	Cambria
Standard Oil Co.....	a 3	Coke	.....	Am. C. & F.
Sun Co.....	a 60	Tank	... 80,000	Am. C. & F.
Swift & Co.....	300	Beef	.....	Co. shops
	250	Freight	.....	Has. & Bar.
Tenn. Coal, Iron & R. R. Co.....	am 20	Tank	... 80,000	Press. Steel
Tennessee Copper Co....	a 35	Tank	...100,000	Am. C. & F.
Toronto, Hamilton & Buffalo	cn 10	Stock	... 60,000	Nat. Steel
Thwing, F. H., & H. M. Evans	a 120	Tank	... 80,000	Am. C. & F.
Union Ref. Tran. Co....	bn 500	Refrig.	.. 80,000	Am. C. & F.
Union Tank Line.....	an 1000	Tank	... 6,500 g.	Std. Steel
U. S. Navy.....	am 4	Flat	 60,000	Laconia
Utah Copper Co.....	50	Dump	...30 yds.	Clark Car
	an 100	Ore	100,000	Press. Steel
	100	Ore	.....	Std. Steel
	an 300	Box	100,000	Has. & Bar.
Vandalia				
Vicksburg, Shreveport & Pac.	cn 23	Box	 60,000	Am. C. & F.
Vilas Lbr. Co.....	f 13	Logging	. 40,000	Russel W. & F.
Virginia-Carolina	bm 120	Box	 60,000	Am. C. & F.
Warner, Quinlan Asph. Co.	a 30	Tank	... 60,000	Am. C. & F.
	a 10	Tank	...100,000	Am. C. & F.
Western Maryland	an 3000	Hopper	.100,000	Pullman
Western Pacific	cm 1000	Box	 80,000	Pullman
West Jersey & Seashore	an 56	Long gon.	140,000	Altoona Shops
	an 1	M. W. flat	100,000	Altoona Shops
	an 30	Box	100,000	Press. Steel
	an 13	Long gon.	140,000	Am. C. & F.
Wheeling & Lake Erie..	cn 200	Auto.	 80,000	West. Steel
	an 200	Gondola	..140,000	Press. Steel
	an 400	Gondola	..140,000	Std. Steel
Wil. Brunswick & So...	5	.....	.....	Ga. Car
Winston - Salem Southbound	an 20	Flat	 80,000	Am. C. & F.
	an 15	Flat	140,000	Press. Steel
Wood Products Co.....	an 25	Tank	... 8,200 g.	Ger. Am.
Yale & Towne Mfg. Co..	f 4	Platform..	20,000	Russel W. & F.

ORDERS FROM FOREIGN RAILWAYS

British War Dept.....	c 1200	Box	 60,000	Can. C. & F.
Cuban Central	100	Box	 30,000	Std. Steel
	200	Flat	 30,000	Std. Steel
	25	N. g. flat.	30,000	Std. Steel
	50	N. g. box.	30,000	Std. Steel
	20	Flat bod.	30,000	Std. Steel
French Government.....	am 1000	Gondola	. 44,000	Eastern
	1000	Box	.....	Keith Car
Guantanamo & Western.	10	.....	.....	Magor
Nigerian Ry.	bm 100	L. s. gon.	.....	Can. C. & F.
	f 100	Coal	 20,000	Can. C. & F.
Russian Government....	a 5000	Gondola	.110,000	Press. Steel
	c 2000	Box	 88,000	Press. Steel
	c 2000	Box	 88,000	Eastern
	c 4100	Box	 88,000	Am. C. & F.
	200	Freight	.....	Magor
	250	Freight	.....	Magor
	b 60	Flat	110,000	Press. Steel
South Africa, High Com. for	am 2	Flat	100,000	Can. C. & F.
United Rys. of Havana.	645	Flat	 40,000	Std. Steel
	50	Flat	 60,000	Std. Steel
	100	Box	 60,000	Std. Steel
	10	Caboose	.....	Std. Steel

a Indicates all-steel cars.
b Indicates steel underframe cars.
c Indicates steel frame cars.
d Indicates composite underframe cars.
f Indicates all-wood cars.
g Indicates steel end cars.
m Indicates spring draft gear.
n Indicates friction draft gear.

PASSENGER CARS ORDERED IN 191 5

Purchaser	No.	Kind	Builder
Alberta & Gt. Waterways..	a 2	Gasolene mech. drive	McKeen
Atlantic Coast Line.....	ax 2	Coaches	Pullman
	ax 3	Mail & bagg.....	Pullman
	ax 1	Pass. & bagg.....	Pullman
Baltimore & Ohio.....	ax 33	Coaches	Pullman
	ax 5	Pass. & bagg.....	Pullman
	ay 2	Bagg. & mail....	Pullman
	ay 4	Baggage	Pullman
	ax 6	Cafe coaches.....	Pullman
Bevier & Southern.....	f 1	Pass. & bagg.....	Am. C. & F.
Boston & Albany.....	ax 25	Coaches	Osgood-Brad.
Boston & Maine.....	ay 4	Mail	Laconia
	ax 2	Mail	Laconia
	ax 6	Baggage	Laconia
	ax 6	Coaches	Pullman
	ax 2	Smoking	Pullman
Bureau of Fisheries.....	aw 1	Fish	Har. & Holl.
Butte, Anaconda & Pac.....	ax 1	Mail & baggage..	Am. C. & F.
Canadian Pacific.....	ay 12	Postal	Co. shops
	ay 1	Bagg. & mail....	Co. shops
	ay 4	Baggage	Co. shops
	ax 1	Dining	Co. shops
Central of Georgia.....	ay 4	Express	Pullman
	ax 1	Bagg. & mail.....	Pullman
Central of New Jersey.....	ax 40	Coaches	Har. & Holl.
	ax 10	Pass. & baggage..	Har. & Holl.
	ax 5	Bagg. & mail....	Har. & Holl.
	ax 5	Bagg. & exp.....	Har. & Holl.
Chic., Burlington & Quincy.	a 8	Dining	Am. C. & F.
	a 9	Pass. & bagg.....	Am. C. & F.
	a 15	Coaches	Am. C. & F.
	a 15	Chair	Am. C. & F.
	a 2	Coach & smoking.	Am. C. & F.
	a 5	Postal	Am. C. & F.
Chicago & North Western..	ay 10	Coaches	Am. C. & F.
	ay 3	Smoking	Am. C. & F.
	ay 10	60-ft. Baggage....	Am. C. & F.
	ay 3	70-ft. Baggage....	Pullman
	ay 5	Pass. & baggage..	Pullman
	ay 10	Baggage & mail..	Pullman
	ax 2	Chair	Pullman
	ax 4	Parlor	Pullman
	ax 3	Obs. buffet-lounging	Pullman
Chicago Elevated Railways..	ax 122	Motor elevated...	Cincinnati
Chicago Great Western.....	ax 2	Buffet chair.....	Pullman
	ax 2	Cafe obser.....	Pullman
	ax 2	Pass & bagg.....	Pullman
	a 1	Postal	Am. C. & F.
Chic., Milwaukee & St. Paul	axy 7	Obs. sleeping.....	Pullman
	axy 2	Obs. lounging....	Pullman
Chic., St. Paul, Minn. & Omaha	ax 2	Dining	Pullman
	ax 2	Obs. lounging....	Pullman
Chic., Wau & Fox Lake Tract.	a 1	Gasolene mech. drive	McKeen
Cleve., Cin., Chic. & St. L..	ax 15	Coaches	Bar. & Smith
Colorado Midland.....	dy 3	Pass. & mail.....	Co. shops
Delaware & Hudson.....	ax 9	Coach & smoking.	Bar. & Smith
	ax 9	Coach & smoking.	Am. C. & F.
	ax 6	Baggage	Am. C. & F.
Del., Lackawanna & Western	ax 3	Bagg. & mail.....	Am. C. & F.
	ax 2	Mail & exp.....	Am. C. & F.
	ax 2	Dining	Pullman
	ax 10	Express	Pullman
Eaton, Sir J. C.....	ax 1	Private	Preston
El Paso & Southwestern....	ax 2	Dining	Pullman
	ax 2	Observation	Pullman
Erie	ax 11	Coaches	Pressed Steel
	ax 2	Pass. & baggage..	Pressed Steel

Purchaser	No.	Kind	Builder
Florida East Coast	ax 1	Gas-electric	Gen. Elec.
Ft. Dodge, Des Moines & So.	ax 3	Pass. & baggage	Am. C. & F.
Ga. Southern & Fla.	ax 2	Pass. & baggage	Pressed Steel
Grand Rapids & Indiana	ax 6	Coaches	Pressed Steel
Grand Trunk Pacific	b 50	Exp. refrig.	Can. C. & F.
Green Bay & Western	b 1	Coach	Am. C. & F.
Illinois Central	b 100	Pass. refrig.	Am. C. & F.
Illinois, State of	a 1	Private	McGuire - Cummings
Interborough Rapid Tran.	ax 12	Subway	Pressed Steel
	ax 478	Subway	Pullman
	ax 311	Subway	Pullman
Intercolonial	ax 4	Sleeping	Preston
Kewaunee, Green Bay & W.	b 1	Coach	Am. C. & F.
Lehigh Valley	d 20	Milk	Std. Steel
	ax 2	Dining	Pullman
London & Port Stanley	bx 3	Coaches	Preston
	bx 1	Baggage	Preston
Long Island	ax 20	Trailer coaches	Std. Steel
	ax 25	Trailer coaches	Std. Steel
	ax 1	Club	Am. C. & F.
	ax 10	Baggage	Am. C. & F.
	ax 6	Parlor	Am. C. & F.
Louisville & Nashville	ax 2	Pass. & baggage	Am. C. & F.
	ax 4	Smoking & comp. coaches	Am. C. & F.
	ax 4	Smoking & comp. coaches	Am. C. & F.
	ax 2	Baggage	Am. C. & F.
	ax 4	Bagg. & mail	Am. C. & F.
Michigan Central	ax 15	Coaches	Am. C. & F.
Minn., St. P., Roch. & Dubuque	ax 12	Passenger	J. G. Brill
	ax 1	Bagg. & mail	Co. shops
	ax 1	Baggage	Co. shops
	ax 2	Gas. Elec.	Gen. Elec.
Minn., St. Paul & S. S. Marie	ax 6	Postal	Am. C. & F.
Mo., Kansas & Texas	a 15	Baggage	Am. C. & F.
	a 4	Dining	Am. C. & F.
	a 2	Postal	Am. C. & F.
Muscatine & Iowa City	ax 4	Gas electric	Gen. Elec.
Nash., Chattanooga & St. L.	ax 2	Postal	Am. C. & F.
New York Central	ax 30	Coaches	Am. C. & F.
	ax 20	Coaches	Osg. Bradley
New York Municipal	ax 100	Motor subway	Am. C. & F.
	ax 100	Subway	Am. C. & F.
N. Y., N. H. & H.	ax 65	Coaches	Osgood-Brad.
	ax 20	70 ft. baggage	Osgood-Brad.
	ax 15	60 ft. baggage	Osgood-Brad.
	ax 2	Dining	Pullman
N. Y., Phila. & Norfolk	bx 2	Coaches	Pressed Steel
N. Y., Westchester & Boston	ax 15	Passenger	Pressed Steel
Norfolk & Western	ax 10	Coaches	Har. & Holl.
	ax 12	Bagg. & exp.	Am. C. & F.
	ax 2	Mail	Am. C. & F.
Pennsylvania R. R.	ax 36	Coaches	Altoona shops
	ax 8	Baggage	Altoona shops
	ax 19	Bagg. & mail	Altoona shops
	ax 4	Pass. & bagg.	Altoona shops
	ax 5	Pass. bagg. & mail	Altoona shops
Pennsylvania R. R.—Continued.	ax 5	Bagg. & mail	Altoona shops
	ax 10	Bagg. & mail	Altoona shops
	ax 17	Coaches	Am. C. & F.
	ax 8	Pass. & bagg.	Pressed Steel
	ax 5	Horse-express	Pressed Steel
	ax 14	Baggage	J. G. Brill
	ax 28	Baggage	J. G. Brill
	ax 11	Baggage	Am. C. & F.
	ax 5	Horse-express	Am. C. & F.
	ax 6	Coaches	Pressed Steel
Pennsylvania Lines West	ax 12	Bagg. & mail	Pullman
	ax 6	Dining	Pressed Steel
	ax 10	Coaches	Pressed Steel
	ax 7	Baggage	Std. Steel
	ax 22	Coaches	Pressed Steel
	ax 3	Pass. & bagg.	Pressed Steel
	ax 8	Bagg. & mail	Pullman
	ax 6	Dining	Pullman
	ax 20	Baggage	Std. Steel
Philadelphia & Reading	ax 10	Coaches	Pullman
	ax 5	Pass. & baggage	Pullman
	ax 10	Coaches	Har. & Holl.
	ax 20	Coaches	Har. & Holl.
	ax 10	Pass. & baggage	Har. & Holl.
	ax 2	Baggage & mail	Co. shops
Phila., Balt. & Wash.	ax 10	Coaches	Altoona shops
	ax 2	Baggage	Altoona shops
	ax 5	Pass., bagg. & mail	Altoona shops
	ax 14	Baggage & mail	Altoona shops
	ax 15	Coaches	Std. Steel
	ax 7	Coaches	Pressed Steel
	ax 6	Pass. & bagg.	Std. Steel
	ax 2	Baggage	J. G. Brill
	ax 7	Baggage	Am. C. & F.
Pullman Company	ax 462	Sleeping	Pullman
	ax 40	Parlor	Pullman
Rich., Fred. & Potomac	ax 6	Coaches	Am. C. & F.
	ax 2	Postal	Am. C. & F.
Temiskaming & Nor. Ont.	ax 2	Bagg. & exp.	Pullman
	ax 2	First class	Pullman
U. S. Army, Q. M. Dept.	bx 1	Pass. & bagg.	Am. C. & F.
Vandalia	ax 4	Coaches	Pressed Steel
	ax 4	Pass. & bagg.	Pressed Steel
	ax 3	Pass. & bagg.	Pressed Steel
	ax 4	Bagg. & mail	Pullman
	ax 4	Baggage	Std. Steel
Wabash	ax 2	Mail	Am. C. & F.
Wells, Fargo & Co.	b 35	Pass. refrig.	Pullman
Western Pacific	ax 5	Baggage & mail	Am. C. & F.
West Jersey & Seashore	ax 4	Coaches	Altoona Shops
	ax 4	Bagg. & mail	Altoona Shops
	ax 3	Coaches	Am. C. & F.
	ax 6	Pass. & bagg.	Std. Steel
	ax 5	Coaches	Std. Steel
	ax 47	Coaches	Har. & Holl.
	ax 3	Baggage	Am. C. & F.

a Indicates all-steel cars.
b Indicates steel underframe cars.
c Indicates steel frame cars.
d Indicates composite underframe cars.
f Indicates all-wood cars.
x Indicates electric lighting.
y Indicates gas lighting.
w Indicates oil lighting.

LOCOMOTIVES ORDERED IN 1915

Purchaser	No.	Cylinders	Total Weight	Type	Builder
Akron & Barberton Belt.	1	20x24	144,500	2-6-0	Baldwin
	1	20x24	144,500	2-6-0	Baldwin
Alabama & Tombigbee	1		83,000	2-8-0	Lima
Alberta & Gt. Waterways	*2	24x32	133,000	4-6-0	Canadian
Algoma Lbr. Co.	1	17x24	121,700	2-6-2	Baldwin
Allegheny Steel Co.	†1	19x24	118,000	0-6-0	Baldwin
Am. R. R. of Porto Rico	‡3	14&20x20	83,000	2-8-0	American
American Smelters Sec. Co.	1	8x12	64,000	Shay	Lima
Anderson, Edw. G.	1		80,000	Geared	Heisler
Angelina County Lbr. Co.	1	10x12	84,000	Shay	Lima
Arkansas Construction Co.	1	6x10	26,000	Shay	Lima
Arthur Iron Min. Co.	*†8	20x24	130,000	0-6-0	Lima
Atchison, Top. & Santa Fe	*30	25x32	293,000	2-8-2	Baldwin
Atlantic Coast Line	*†10	22x28	226,800	4-6-2	Baldwin
Baltimore & Ohio	*‡‡15	26&41x32	485,000	2-8-8-0	Baldwin
	*‡‡15	26&41x32	485,000	2-8-8-0	American
Bates & Rogers Const. Co.	2	7x12	17,200	0-4-0	Baldwin
Bethlehem Steel Co.	2	22x28	196,000	0-8-0	American
	1	21x26	153,000	0-6-0	American
Big Creek Logging Co.	1	11x12	100,000	Shay	Lima
Bingham & Garfield	*6	21x24	152,000	0-6-0	Baldwin
Birmingham Southern	*2	22x26	160,000	0-6-0	American
	*1	23x28	202,000	2-8-0	American
Blackwell Lbr. Co.	1	12x12	120,000	Shay	Lima
Boston & Albany	*‡‡4	21½&34x32	354,000	2-6-6-2	American
Brodie, James, & Sons	1	13x18	60,000	0-6-0	Canadian
Bruce & Findlaym	1		52,000	Geared	Heisler
Butte, Anaconda & Pacific	1		160,000	Electric	Gen. Elec.
Caddo River Lbr. Co.	*1	20½x28	179,050	2-8-2	Baldwin
	1	19x26	140,000	2-6-0	American
Calumet & Ariz. Min. Co.	1	19x26	133,000	0-6-0	American
Cambria Steel Co.	2			0-6-0	Baldwin
Canadian Copper Co.	1	21x26	159,000	0-6-0	Baldwin
Canadian Govt. Railways	*15	24x32	232,000	2-8-0	Canadian
Canadian Pacific	*8	19x24	138,700	4-6-0	Co. shops
Canal Lbr. Co.	1		80,000	Geared	Heisler
Carnegie Steel Co.	1	20x26	154,000	0-6-0	Baldwin
	2			0-6-0	Baldwin
Carney, W. M., Mill Co.	1	11x12	100,000	Shay	Lima
Carolina & Yadkin River	1		Elec. equip. only		Gen. Elec.
Central Coal & Coke Co.	1	12x15	140,000	Shay	Lima
Central New England	*†4	26x32	328,000	2-8-2	American
Central of Georgia	*†8	27x30	284,400	2-8-2	Lima
	*†4	23x28	222,300	4-6-2	Lima
Champion Lbr. Co.	1	14½x15	180,000	Shay	Lima
Chesapeake & Ohio	*††34	22&35x32	434,000	2-6-6-2	American
	*†1	22x26	200,000	4-4-2	American
	*†6	23½x28	204,000	2-8-0	American
Chess & Wymond	1		144,500	0-6-0	Baldwin
Chestnut Ridge	1	21x26	64,000	Geared	Heisler
Chic., Milwaukee & St. Paul	24		Elec. Freight		Gen. Elec.
	6		Elec. Frt. with steam htg. device for pass. service		Gen. Elec.
	2		Electric Switch		Gen. Elec.
Chicago & North Western	*†6	25x28	260,000	4-6-2	American
	*†6	22x26	229,000	4-6-2	American
	*†12	27x32	302,000	2-8-2	American
	*†10	21x28	165,000	0-6-0	American
	1	12x18	55,000	2-6-0	American
Chic. Bur. & Quincy	*†15	27x28	266,400	4-6-2	Baldwin
	*†15	28x32	315,400	2-8-2	Baldwin
	*†10	30x32	367,850	2-10-2	Baldwin
Chicago Great Western	*†5	21x26	148,200	0-6-0	Baldwin
	10			2-8-2	Baldwin
Chicago Junction	*†3	20x26	148,000	0-6-0	American
Chicago River & Indiana	*†1	20x26	149,500	0-6-0	American
Chic., St. Paul, Minn. & Omaha	*†4	25x28	260,000	4-6-2	American
	*†6	27x32	302,000	2-8-2	American
Chrome Steel Works	1	14x22	64,000	0-4-0	Baldwin
Cincinnati, Ind. & West.	*†10	19x28	160,000	4-6-0	Baldwin
	*†10	22x28	180,000	2-8-0	Baldwin
	*†8	27x30	286,000	2-8-2	Lima
	*†5	22x28	163,000	0-6-0	Lima
	*†6	21x28	194,000	4-6-0	American
Cleve., Cin., Chic. & St. Louis	*†5	22x26	242,000	4-6-2	American
	1	21x28	170,000	0-6-0	American
Colorado & Southern	*†5	30x32	367,850	2-10-2	Baldwin
Columbia, Newberry & Laurens	1	21x26	156,000	2-8-0	Baldwin
Copper River & No. West.	3	20x28	196,000	2-8-2	American
Crabbs-Reynold Taylor Co.	1		Elec. equip. only		Gen. Elec.

* Indicates superheater. † Indicates brick arch. ‡ Indicates compound.

Purchaser	No.	Cylinders	Total Weight	Type	Builder
Crane Iron Works.....	†1	16x24	99,350	0-4-0	American
Crossett Lumber Co.....	1	22x26	197,000	2-8-2	Lima
Crowell & Spencer Lbr. Co.	1	16x24	109,700	2-6-2	Baldwin
Cupey Sugar Co.....	1	11x16	39,000	0-4-0	American
Cushing Traction Co....	1		100,000	Electric	West. Bald.
Dantzler, L. N., Lbr. Co.	1		94,000	Geared	Heisler
Davison Lbr. Co.....	1	11x12	100,000	Shay	Lima
Death Valley R. R.....	1			2-8-0	Baldwin
Deep River Logging Co..	1	16x24	111,000	2-6-2	Baldwin
Delaware & Hudson....	*†1	27x32	295,000	2-8-0	American
Delaware, Lackawanna & Western	*†5	27x28	310,500	4-6-2	American
Delray Connecting	1	22x28	208,000	0-8-0	American
Delta Chemical Co.....	1	8x12	64,000	Shay	Lima
Delta Land & Timb. Co..	†1	18x24	143,200	2-8-2	Baldwin
Denver & Salt Lake....	*†8	26x30	295,000	2-8-2	Lima
Detroit Terminal	*2	21x28	172,000	0-6-0	American
	*1	25x30	240,000	0-8-0	American
Detroit United Rys.....	1		100,000	Electric	Westinghouse
Des Moines Union.....	†2	19x26	123,000	0-6-0	Baldwin
Diamond Lbr. Co.....	1	10x12	84,000	Shay	Lima
Duluth & Iron Range...	*†3	27x30	300,000	2-8-2	Baldwin
Duluth, Missabe & No...	*†‡2	26&40x32	464,000	2-8-8-2	Baldwin
	*†6	28x32	342,000	2-10-2	Baldwin
E. Tennessee & Western N. C.	1	16x22	96,000	4-6-0	Baldwin
	1			4-6-0	Baldwin
Eccles, W. H., Lbr. Co..	1		80,000	Geared	Heisler
Elgin, Joliet & Eastern..	*†9	24x28	215,000	0-8-0	American
	*†18	28x30	307,000	2-8-2	American
Erie	*†10	31x32	415,400	2-10-2	Baldwin
	*†13	31x32	415,000	2-10-2	American
	*†5	31x32	395,000	2-10-2	American
	*†5	31x32	415,400	2-10-2	Lima
	*†‡2	36&36&36x32		2-8-8-8-2	Baldwin
	*†10	25x28		4-6-2	American
Eureka Nevada	†1	12x16	38,500	2-6-2	Porter
	†1	10x14	26,000	2-4-4	Porter
Fairchild & Northeastern	1	16x24	110,000	2-6-2	Lima
	1	16x24	104,000	2-6-0	Vulcan
Fairview Fluorspar & Lead Co.	†1	17x24	102,500	0-6-0	Baldwin
Ft. Dodge, Des Moines & So.	2		120,000	Electric	Gen. Elec.
Fort Worth & Denver City	*10	27x30	266,400	2-8-2	Baldwin
Frost-Johnson Lbr. Co...	1	16x24	101,600	2-6-2	Baldwin
Garden City Wesern.....	1	18x24	109,000	2-6-0	Baldwin
General Chemical Co....	2	9x14	24,000	0-4-0	Baldwin
Ga. Southern & Fla.....	*2	21x28	192,250	4-6-0	Baldwin
Gillespie, T. A., Co.....	1	6x10	26,000	Shay	Lima
Grand Rapids & Indiana.	*†3	26x28	254,080	2-8-0	Lima
Granly Min. & Smelt Co..	1	8x12	16,900	0-4-0	Baldwin
Guthrie, A., & Co., Inc..	2	20x26	135,000	0-6-0	Baldwin
Harbeson, W. B., Lbr. Co.	1	15x24	96,250	2-6-2	Baldwin
	1	10x14	40,000	2-4-2	Baldwin
	1	15x24	92,650	2-6-2	Baldwin
	1	15x24	92,650	2-6-2	Baldwin
Harlan & Hollingsworth..	1	14x22	67,000	0-4-0	Baldwin
Hebard Cypress Co.....	1	18x24	114,000	2-8-0	Baldwin
Henderson L. & Lbr. Co.	1	12x15	140,000	Shay	Lima
Holmes, Clair	1	6x10	26,000	Shay	Lima
House, A. C., Lbr. Co...	1		40,000	Geared	Heisler
Illinois Central	*†47	27x30	283,850	2-8-2	Lima
	*†3	29x32	346,000	2-10-2	American
	*†25	27x30	280,000	2-8-2	Lima
	*†25	27x30	280,000	2-8-2	Lima
	*†4	27x30	284,400	2-8-2	Lima
Inland Crystal Salt Co...	1	16x24	98,000	0-6-0	Baldwin
Intermountain	1	12x15	146,000	Shay	Lima
Interstate	*†3	25x32	231,000	2-8-0	Baldwin
Ironton R. R.....	*1	21x28	163,000	0-8-0	Baldwin
Jamestown, Westfield & N. W.	1		90,000	Electric	West. Bald.
Kelly Bros.	1	6x10	26,000	Shay	Lima
Kress, F. J., Box Co...	1	8x12	64,000	Shay	Lima
LaBelle Iron Wks.....	†1	17x24	102,700	0-4-0	Baldwin
L. E. Franklin & Clarion	1	22x28	180,000	2-8-0	American
Lake Erie & Northern..	2		120,000	Electric	West. Bald.
Lake Sup. & Ishpeming..	*3	26x30	270,000	2-8-0	Baldwin
La Salle & Bureau Cnty.	†1	22x26	150,400	0-6-0	Baldwin
Lehigh & Hudson River..	*†4	25x30	290,000	2-8-2	Baldwin
Lehigh & New England.	*2	22x28	207,850	0-8-0	Baldwin
	4			Switch	Baldwin
	1			2-8-0	Baldwin
Lehigh Valley	*10	25x28	263,000	4-6-2	Co. Shops
	*10	27x30	318,400	2-8-2	Baldwin
	*10	27x30	318,400	2-8-2	Baldwin
Lehigh Vy. Coal Co.....	1	10x16	39,700	0-4-0	Baldwin
Ligonier Valley	†1	21x28	183,600	2-8-0	Baldwin
Louisiana Ry. & Nav. Co.	*3	20x26	156,500	4-6-0	Baldwin
Maine Central	2	21x28	166,000	0-6-0	American
Maryland Electric	1		92,000	Electric	West. Bald.
Maryland Steel Co.....	†2	19x24	108,000	0-6-0	Baldwin
Michigan Central.....	*†7	23½x26	271,000	4-6-2	American
Mine La Motte Co.....	1	17x24	128,500	2-6-2	Baldwin
Minneapolis & St. Louis.	*†5	24x30	259,900	2-8-2	American
Minnesota Steel Co.....	3				Porter
Minn., St. Paul & Sault Ste. Marie	*†6	20x26	149,000	0-6-0	American
Minn., St. P., Roch. & Dubuque	3		112,000	Gas-ele.	Gen. Elec.
Missouri, Kan. & Tex...	*†12	25x28	272,000	4-6-2	American
	*†35	28x30	319,000	2-8-2	American
Missouri, Okla. & Gulf...	*†4	23x28	230,900	2-8-2	Baldwin
Mobile & Ohio.....	*3	27x30	272,940	2-8-2	Baldwin
Monongahela Connecting.	*†3	21x26	152,000	0-6-0	Porter
Monongahela R. R.....	6	22½x30	200,000	2-8-0	American
Montour R. R.....	*†4	27x32	313,000	2-8-2	American
Moore, Harry V.....	1	6x10	26,000	Shay	Lima
Morley Cypress Lbr. Co.	1	8x10	56,000	Shay	Lima
Mountain Copper Co....	1	10x12	84,000	Shay	Lima
Mt. Hope Mineral.....	†1	19x26	141,700	2-8-0	Baldwin
Munising, Marquette & Southwestern	*1	26x30	270,000	2-8-0	Baldwin

Purchaser	No.	Cylinders	Total Weight	Type	Builder
Nash. Chattanooga & St. Louis	*†5	25x30	264,300	2-8-2	Baldwin
	*†2	23x28	219,550	4-6-2	Baldwin
	*†‡3	27&41x30	470,000	2-8-8-2	Baldwin
Newburgh & South Shore	*†1	23x26	189,000	2-6-0	Baldwin
New York Central.....	1			4-8-2	American
N. J. Zinc Co. of Pa....	1	21x26	146,000	0-6-0	Baldwin
New Orleans & Northeastern	*†2	22x28	209,500	2-8-2	Baldwin
N. Y., New Haven & Hartford	*†25	25x30	260,000	2-8-2	American
	*†4	26x32	328,000	2-8-2	American
N. Y., Ontario & Western	*†12	28x32	352,500	2-10-2	American
Norfolk & Portsmouth Belt	1			0-6-0	Baldwin
Norfolk Southern	6			2-8-0	Baldwin
Norfolk & Western.....	*††30	22&35x32	406,000	2-6-6-2	American
	*†8	29x28	341,000	4-8-2	Co. Shops
	15		540,000	Electric	West. Bald.
North, C. W., & Co....	1	6x10	26,000	Shay	Lima
	1	6x10	26,000	Shay	Lima
Oahu Ry. & Land Co...	1	15x20	86,000	4-6-0	American
	1	16x20	102,000	2-8-0	American
	1	14x20	68,000	0-6-0	American
Ocean Shore	1	18x24	110,250	2-6-0	Baldwin
Ogden, Logan & Idaho..	2		102,000	Electric	West. Bald.
Ozan Graysonia Lbr. Co.	2			2-8-2	Baldwin
Pacific Electric	4		120,000	Electric	Westinghouse
Pac. Portland Cement Co.	1	20½x28	177,000	2-8-2	Baldwin
Peninsular	1	19x24	152,000	2-8-2	Baldwin
Pennsylvania R. R.....	*†76	27x30	319,300	2-8-2	Juniata Shops
	*†53	22x24		0-6-0	Juniata Shops
	*†11	20x24		0-4-0	Juniata Shops
	*†75	27x30	319,300	2-8-2	Baldwin
Penn. Lines West.....	*25	26x28	254,080	2-8-0	Baldwin
	*15	26x28	254,080	2-8-0	Lima
	*2	26x28	254,080	2-8-0	Lima
	*48	26x28	254,080	2-8-0	American
Philadelphia & Reading..	*4	23½x26	230,800	4-4-4	Co. Shops
	*10	24x32	334,425	2-8-2	Baldwin
	*20	24x32	334,425	2-8-2	Baldwin
Phila., Balt. & Wash....	*†4	22x24		0-6-0	Juniata Shops
Pickands Mather Co....	1	17x24	120,000	0-6-0	Lima
Pine Belt Lbr. Co.....	1	20x28	181,900	2-8-2	Baldwin
Pittsburgh & Lake Erie..	*†10	27x30	322,000	2-8-2	American
	*††2	26&40x28	463,000	0-8-8-0	American
Pittsburgh Steel Co....	1	20x24	126,000	0-6-0	American
Pittsburgh Steel Ore Co..	†1	20x24	126,000	0-6-0	Baldwin
Poplarville Saw Mill Co.	1	16x22	87,500	2-8-0	Baldwin
Port Huron Southern...	1	18x24	100,000	0-6-0	Baldwin
Portland Lbr. Co.....	1	11x12	100,000	Shay	Lima
Portsmouth St. Ry. & Light Co.	1		100,000	Electric	Gen. Elec.
Prescott & Northwestern	1			2-8-2	Baldwin
Pub. Belt of New Orleans	*†5	19x24	130,000	0-6-0	Baldwin
Pullman R. R.....	2	21x26	142,000	0-6-0	American
Quanah, Acme & Pac....	*†1	20x26	158,200	2-8-0	Baldwin
Rapid City, Black Hills & Western	1	15x24	95,000	2-6-2	Baldwin
Raritan River	†2	20x24	167,000	2-8-2	Baldwin
Red River & Gulf.....	1	18x26	126,300	4-6-0	Baldwin
Remington Arms—U. M. C. Co.	1	13x18	58,000	0-4-0	American
Rep. Iron & Steel Co...	†1	22x26	155,200	0-6-0	Baldwin
Rich., Fred. & Potomac.	*†2	26x28	293,000	4-6-2	Baldwin
	4			4-6-2	Baldwin
Rio Grande Ry.....	1		24,000	Electric	West. Bald.
S. & A. Lbr. Co.....	1	15x20	86,800	2-6-2	Baldwin
San Fernando Rock Co..	1	13x18	59,450	0-6-0	Baldwin
Scotch Lbr. Co.....	1	18x24	120,240	2-8-0	Lima
Sheffield & Tionesta....	1	13x22	72,200	4-4-0	Baldwin
Simmons, Dennis, Lbr. Co.	1		44,000	Geared	Heisler
South Dakota Central...	2	18x24	136,000	4-6-0	American
	1	20x28	178,000	2-8-2	American
Standard Oil Co.....	2	6x10	13,600	0-4-0	Baldwin
	1	17x24	110,500	0-6-0	Baldwin
St. Louis Stock Yds....	1	19x24	121,000	0-6-0	American
St. Paul Bridge & Term.	1	20x26	154,000	2-6-0	American
St. Paul Union Depot..	*†2	19x26	129,000	Switch	Lima
Sapulpa & Oil Field Ry.	1		100,000	Electric	West. Bald.
Shevlin Hixon Co.....	1		120,000	Shay	Lima
Sierra Nevada Wood & Lbr. Co.....	1	11x12	120,000	Shay	Lima
Sioux City Terminal....	1	19x24	117,000	0-6-0	American
Skaneateles R. R.....	1	18x24	118,000	2-6-0	American
Solvay Process Co.....	1	21x26	156,000	0-6-0	American
Standard Oil Co.....	1	21x26	154,000	0-6-0	American
Sumpter Valley	3	17x22	126,000	2-8-2	Baldwin
	1	16x20	91,000	4-6-0	Baldwin
Tall Timber Lbr. Co....	1	12x12	138,000	Shay	Lima
Tavares & Gulf.....	1			2-6-2	Baldwin
Texas & Pacific.....	*6	28x32	328,500	2-10-2	Baldwin
	*7	21x28	156,000	0-6-0	Baldwin
Texas State R. R.....	1	19x24	122,350	2-6-0	Baldwin
Thompson Bros. Lbr. Co.	1	16x24	117,500	2-6-2	Baldwin
Toledo-Detroit	2	21x28	160,000	2-8-0	American
Toledo & Western.....	1		120,000	Elec.	West. Bald.
Toledo, St. L. & Western	*†5	22x28	193,000	2-8-0	Lima
Toledo Terminal.....	*†3	22x28	198,000	2-8-0	American
Union Lbr. Co.....	1	15x22	110,100	2-6-2	Baldwin
Union R. R.....	5			2-8-0	Baldwin
U. S. Gypsum Co.....	1	10x12	84,000	Shay	Lima
U. S. Portland Cement Co.	1	8x14	21,000	0-4-0	Baldwin
United Steel Co.....	†1	17x24	109,000	0-4-0	Baldwin
University of Michigan..	1		56,000	Electric	Gen. Elec.
Utah Copper Co.....	1			0-6-0	Baldwin
	†1	18x24	122,000	0-6-0	Baldwin
Veness, J. A., Lbr. Co..	1	10x12	64,000	Shay	Lima
Upper Lehigh Coal Co..	1	10x14	32,700	0-4-0	Baldwin
Vandalia	*10	26x28	254,080	2-8-0	Lima
	*10	26x28	254,080	2-8-0	Lima
Verde Tunnel & Smelter	*1	21x26	160,000	0-6-0	American

* Indicates superheater. † Indicates brick arch. ‡ Indicates compound.

Purchaser	No.	Cylinders	Total Weight	Type	Builder
Vicksburg, Shreveport & Pac.	*†4	22x28	209,500	2-8-2	Baldwin
Victoria, Fisher & West.	1	15x20	87,950	2-6-2	Baldwin
Waccamaw Lbr. Co.	1	12x16	52,900	2-6-2	Baldwin
Wakefield Iron Co.	†1	17x24	102,300	0-6-0	Baldwin
Walterboro Lbr. Co.	1	12x18	62,000	2-6-2	Baldwin
Waycross & Southern	1				Baldwin
Waynesburg & Washington	1	13x20	50,000	2-6-0	American
Wawa Commercial Co.	1	7x12	36,000	Shay	Lima
Western Maryland	*††15	26&40x30	495,000	2-8-8-2	Lima
Whitaker Glessner Co.	1	17x24	114,000	0-6-0	Lima
White, J. J., Lbr. Co.	1	12x15	140,000	Shay	Lima
Wilson Lbr. Co.	1	15x20	80,500	2-6-2	Baldwin
Wil., Brunswick & So.	1				Ga. Car.
Worth Bros. Co.	3	14x16	60,000	0-4-0	Baldwin
Wisconsin & Northern	*1	20x26	168,000	4-6-0	American
Yellow Poplar Lbr. Co.	2	10x12	84,000	Shay	Lima
Yosemite Lbr. Co.	1	12x15	140,000	Shay	Lima
Youngstown Iron & Steel Co.	2				Porter
Youngstown Sheet & Tube Co.	2	22x26	151,000	0-6-0	Baldwin
	2	17x20	100,000	0-4-0	Baldwin

ORDERS FROM FOREIGN RAILWAYS

Belgian State Railways	20	11½x16	48,000	0-6-0	American
Bethlehem Chile Iron Mines	1	19x24	123,000	0-6-0	American
Bresciana Ry.	3		Elec. equip. only		Gen. Elec.
Buenos Ayres & Western	2		140,000	Electric	West. Bald.
Central Ry. of Brazil	3	21½x28	200,000	4-6-2	American
	3	22x24	146,000	2-8-0	American
Centrale Umbra	11		Elec. equip. only		Gen. Elec.
Cuba R. R.	12	20x26	148,000	4-6-0	American
	10	20x26	152,000	4-6-0	American
Cuban Central	1	16x20	97,000	2-8-0	American
French Government	100	6.88x9.44	28,100	0-4-4-0	Baldwin
French Gov't—for Morocco	6			4-6-0	Baldwin
Frazar & Co.	1				Baldwin
Ginson Battle Co. — Australia	1	8x12	40,000	Shay	Lima
Girardot, F. C. de—Colombia	1	15x20	105,000	2-6-2	American
International Mach'y Co. —Chile	1	9x14	27,000	0-4-0	American
Madrid, Zaragoza & Alicante—Spain	25	16.53&25.2x25.6	193,000	4-8-0	American
Mena, Gomez, Plantation Co.	1	18x24		2-6-0	American
Pacific Commercial Co.	1	13x18	52,000	0-4-0	American
Pekin-Kalgan—China	4	20x28	186,000	2-8-2	American
	2	20x26	183,000	4-6-2	American
Punta Alegra Sugar Co.	1	11x16	39,000	0-4-0	American
	2	12x18	50,000	2-6-0	American
	1	11x16	39,000	0-4-0	American
Russian Government	*†250	25x28	196,000	2-10-0	Baldwin
	*†100	25x28	197,000	2-10-0	American
	*†50	25x28	190,000	2-10-0	Canadian
	15	11x16	40,000	2-6-0	American
	22		144,000		Porter
	11		134,000		Porter
	25				Porter
Samuel, Samuel, & Co.—Japan	1	8x10	56,000	Shay	Lima
Serbian Government	12	15x20	81,000	2-8-0	American
	10	13&20½x20	128,000	2-6-6-2	American
	15	19x24	145,000	2-6-2	American
South African, Union of	6	20x26	158,000	2-8-0	American
United Rys. of Havana.	1		120,000	Electric	Gen. Elec.

* Indicates superheater. † Indicates brick arch. ‡ Indicates compound.

TRANSPORTATION SALESMEN

By J. E. Light

Traveling Freight and Passenger Agent, Southern Pacific Company

While the carriers are bending their efforts toward the creation of favorable public sentiment, it is possible they are overlooking the very department that could best secure this result.

I refer to the field men of the traffic department—transportation sellers. These representatives, more than any other class of railroad men, are in constant touch with the public. An efficient field man can accomplish much in creating a better understanding between the railroads and the public. By diplomacy and ability he can explain to the shipper and general public the reason for many actions of the carriers that—to them, because they do not understand—seem ridiculous and erroneous. To do this, however, such representatives must have a thorough working knowledge of railroad operation and traffic principles.

Commercial corporations feature this element of their business. They must do so or fail. There are many commercial salesmen selling groceries, coffee, produce, etc., and representing companies whose entire investment would not equal the outlay in small station facilities, yet these men are carefully selected and paid much higher salaries than the salesmen for transcontinental carriers. Because of the nature of their business, commercial salesmen are able to show tangible results that warrant the investment. An efficient traffic representative, while unable to measure the result of his efforts in dollars and cents, could nevertheless produce returns that would justify greater consideration by his chief.

In the selection of these representatives care should be taken to appoint men who necessarily must possess enough diplomacy to heal many a breach between carrier and shipper; men with character and initiative to convince a shipper why his line should be used; men with dignity, personality and congeniality befitting a representative of a concern worth millions; men with the business ability and courage to handle a proposition with clever business men without calling on the busy general office for information on matters that they should know. It is my opinion that representatives with the above qualifications would be a profitable investment.

These men should be picked from the railroad ranks. Otherwise they would have no practical transportation knowledge. There are many men with this practical knowledge, obtained by actual experience, but this is the extent of their ability. Also many practical men superficially study the theoretical elements. These men are usually selected. In the majority of cases, however, the transportation knowledge found in these offices is sadly lacking. Most of them are chosen because of their purported good-fellowship and ability to "mix." When unable to secure a man with the above combined qualifications, the "good mixer" characteristic is deemed paramount.

The percentage of these representatives who are familiar with Emory Johnson, McPherson, Dunn, or even George B. McGinty, is indeed small. There is even a smaller percentage who could satisfactorily explain to a shipper why it is necessary and possible to haul a shipment across the continent for less than is charged to haul the same shipment 400 miles inland. Few, indeed, could expound the fallacies of the "zone" system or distance rates when applied to traffic generally.

There is perennial warfare between the various communities in an attempt to obtain for their respective territories an advantage in transportation costs. There are numerous transportation matters which, to the average shipper, are perplexing and confusing. The ability of a traffic field man to give a satisfactory explanation of these matters would create a much better feeling between the shipper and the railroads. Also it would most likely result in increased competitive takings for the line he represents.

I fully believe that the carriers will eventually recognize the importance of selecting efficient men for these positions. The result of such recognition would be a well-organized effort to select congenial young men with ability and train them for this particular work in the same manner employed by commercial concerns. Men of this character will always be a valuable asset to the railroads, even after competition is eliminated—should it ever be.

Public sentiment is largely responsible for the position of the carriers today. I cannot believe that the railroad chiefs realized the potent effect of adverse public sentiment until now. The public is learning something of the carriers' side, and I fully believe that the more they know the better it will be for the carriers' interests. Therefore they should use every means of disseminating information—and an efficient traffic field man would be an important factor in this work.

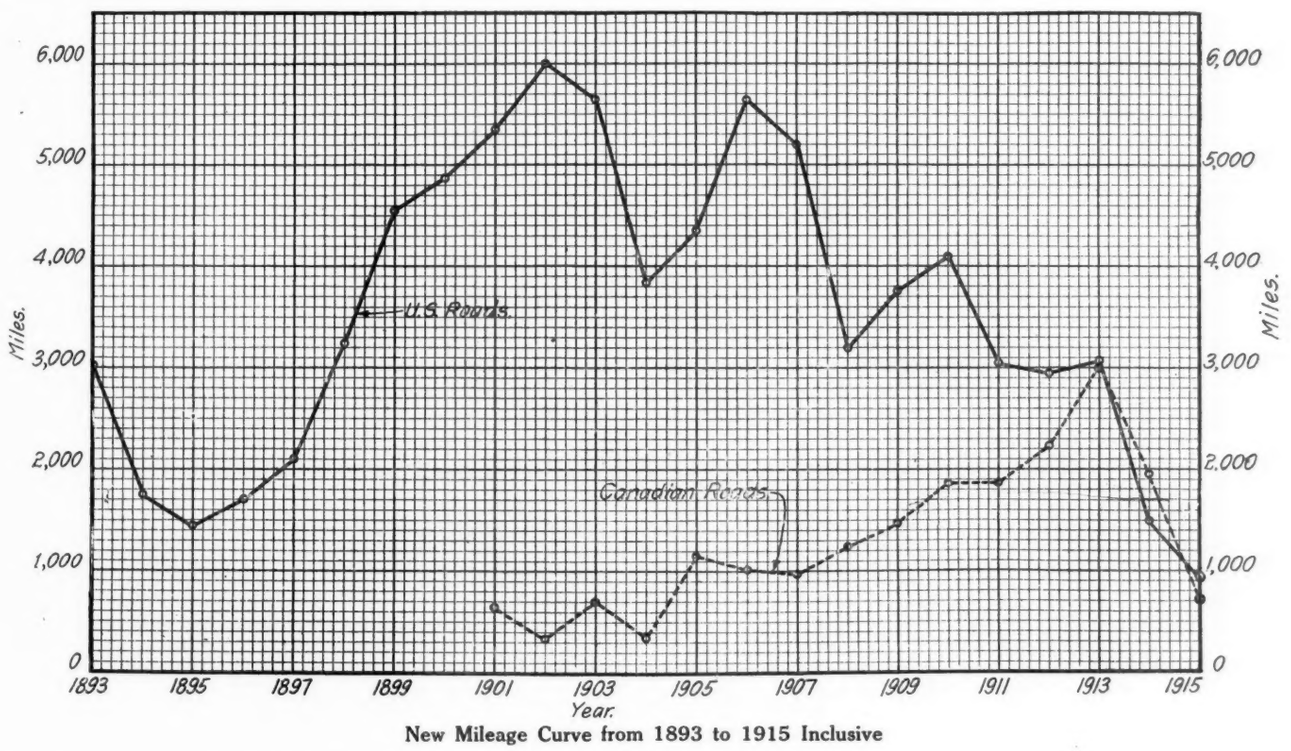
A British Pooling Arrangement.—The fish traffic from Aberdeen, hitherto sent daily by both the Caledonian and North British routes, is now, beginning December 1, being sent by only one route, each company taking all the traffic alternately for a period of two months. The Caledonian will take it for December and January, 1916, while the North British will take it for February and March.

New Railway Construction Statistics for 1915

Less Track Was Built in the United States Than for Any Year Since 1864. Canada Also Shows Decrease

During 1915, 933.24 miles of new first track was completed in the United States and 718.37 miles in Canada. In the same period 356.28 miles of second track was completed in the United States and 0.84 miles in Canada. There was also built during this period 64.70 miles of other multiple main tracks in the United States. Some activity is again noted in Mexico, where 36.50 miles of line was reported completed. The government railways of Alaska report 34 miles of line completed and 350 miles additional projected. These figures are based on reports made directly to us by the various railroads, supplemented by our own construction records and are as complete as it is possible to compile at this time.

As shown by the accompanying diagram and by the tabulation given below, the mileage of first track completed is much less than that for any of the 23 years during which we have collected such statistics. In fact, the mileage reported this year is only about 65 per cent of the smallest mileage reported for any previous year since 1893. The mileage of line completed this year is only 15 per cent of that completed in 1902, the record year since 1893, and only about 25 per cent of the mileage completed during an average year.



New Mileage Curve from 1893 to 1915 Inclusive

The figures of new construction by years beginning with 1893 are as follows:

1893	3,024	1905	4,388
1894	1,760	1906	5,623
1895	1,428	1907	5,212
1896	1,692	1908	3,214
1897	2,109	1909	3,748
1898	3,265	1910	4,122
1899	4,569	1911	3,066
1900	4,894	1912	2,997
1901	5,368	1913	3,071
1902	6,026	1914	1,532
1903	5,652	1915	933
1904	3,832		

New mileage was reported completed in 38 states and territories. There are 11 states in which no new mileage was reported, while less than 5 miles was reported for each of 11 states and less than 10 miles for each of 16 states. Pennsylvania leads in mileage with 98.37 miles completed, while Oregon is second with 82.70 miles, Washington third with 70.88 miles and Kansas is fourth with 58.56 miles. Practically half the mileage reported was for the seven states of Pennsylvania, Oregon, Washington, Kansas, Alabama, Arizona and Kentucky.

The longest continuous line reported built during the year was that of the Gulf, Florida & Alabama from Broughton to Kimbrough, 52.40 miles. This is in marked contrast with extensions of 100 miles or more reported in previous years. The work was generally light in character, although there were one or two notable exceptions. The line involving the heaviest work was that of the Delaware, Lackawanna & Western from Clarks Summit, Pa., to Hallstead, 39.43 miles. This line, which has been described previously in these columns, was built at an expenditure of over $12,000,000.

Our reports show that 356.28 miles of second track was completed in the United States in 1915 as compared with 566 miles in 1914; 1,264 in 1913, and 1,073 miles in 1912. This work was distributed over 25 states, although less than 10 miles was built in each of 16 states and 20 miles or more was built in only six states. The greatest mileage built in any single state was 81.03 miles in Virginia, the next largest was 44.86 in Pennsylvania and the third largest was 39.90 miles in North Carolina, 37.90, of which was built by the Southern Railway between Pelham and Denim. This road also completed 28.40 miles of the second track built in Virginia. The 64.70 miles of other multiple tracks were divided between third track, 36.14 miles; fourth track, 22.96 miles; fifth track, 2.30 miles, and sixth track, 3.30 miles. The third and fourth track mileage consisted principally of that laid on the Clarks Summit line of the Lackawanna in Pennsylvania.

At the present time 1,207.18 miles of new line is reported under construction; 1,624.25 as definitely surveyed, and 2,061.81 miles as projected. Also, 289.41 miles of second track is under con-

struction, 10 miles reported surveyed and 9.40 miles projected. These mileages compare with 1,015 miles of new first track under construction, 1,229 miles surveyed and 2,031 projected one year ago, and 1,522 miles under construction, 1,511 miles surveyed and 1,296 miles projected two years ago.

In 1914, for the first time, the mileage of line completed in Canada exceeded that in the United States. The mileage built in the Dominion this year, however, shows an even greater decrease than that in the United States, falling to 718.37, or less than 37 per cent of that of last year. The European war has, of course, practically put a stop to all construction projects in Canada. Of the mileage built in 1915, 165.95 miles was reported completed by the Canadian Northern (Western Lines) and 14 miles by the Winnipeg & Northern, a subsidiary of this same road. The Edmonton, Dunvegan & British Columbia and its subsidiary in Alberta, the Alberta & Great Waterways, completed 206 miles. The Canadian Pacific (Western Lines) reports only 22.80 miles, indicating that construction activities on this large system are practically at a standstill.

The comparative amounts of various classes of new tracks built in each state during 1915 are shown in the accompanying tables and in detail in the following data:

UNITED STATES.

Alabama.

First Track

	Miles.	Miles.
Gulf, Florida & Alabama—Broughton to Kimbrough	52.40	
Tidewater Securities Corporation—Not specified	0.75	53.15

Second Track

Alabama Great Southern—York to Toomsuba	17.41	
Nashville, Chattanooga & St. Louis—Stevenson to Bridgeport	9.69	
Tidewater Securities Corporation—Not specified	0.75	27.85
Total of all track		81.00

Alaska

First Track

	Miles.	Miles.
United States Government Railway—Ship Cheek spur line, Ship Creek to Ship Creek Junction, 4.80 miles; Ship Creek Junction to Matanuska Junction, 50 miles; total	34.80	34.80
Total of all track		34.80

Arizona

First Track

Mascot & Western—Willcox to Mascot	15.00	
Tucson, Cornelia & Gila Bend—Gila Bend mile post 0 to mile post 35	35.00	50.00
Total of all track		50.00

Arkansas

First Track

Memphis, Dallas & Gulf—Between Murfreesboro and Shawmut	19.00	19.00

Second Track

Memphis, Dallas & Gulf—Between Murfreesboro and Shawmut	1.00	1.00
Total of all track		20.00

California

First Track

California Southern—Blythe Junction to Red Hill	14.00	
Minkler Southern (A., T. & S. F. C. L.) Exeter to Lindsay	6.95	
San Diego & Arizona—United States-Mexican boundary to Campo, 5.9 miles; Corriso Pass to 1.1 miles west of station 6, 4.9 miles; total	10.80	
Stockton Terminal & Eastern—Not specified	0.25	32.00
Total of all track		32.00

Colorado

First Track

Colorado & Southern—Tollerburg to Ben Canon	0.95	
Denver Union Terminal—At terminal	2.77	
Union Pacific—Shamrock Junction to Shamrock Mine	1.01	4.73
Total of all track		4.73

New Track Built in 1915

United States—	No. Cos. building	Miles: First track	Second track	Third track	Fourth or more track	Total
Alabama	2	53.15	27.85	.....	.....	81.00
Alaska	1	34.80	.....	.....	.....	34.80
Arizona	2	50.00	.....	.....	.....	50.00
Arkansas	1	19.00	1.00	.....	.....	20.00
California	4	32.00	.....	.....	.....	32.00
Colorado	3	4.73	.....	.....	.....	4.73
Florida	6	38.65	.....	.....	.....	38.65
Georgia	5	31.64	.....	.....	.....	31.64
Idaho	..	.....	1.75	.....	.....	1.75
Illinois	4	6.90	24.78	.....	.....	31.68
Iowa	..	.....	3.43	.....	.....	3.43
Kansas	4	58.56	4.09	.....	.....	62.65
Kentucky	3	48.89	6.92	.....	.....	55.81
Maine	1	1.33	.....	.....	.....	1.33
Maryland	2	3.40	4.95	.....	.....	8.35
Massachusetts	2	2.00	.....	.....	.....	2.00
Michigan	2	18.50	1.00	.....	.....	19.50
Minnesota	4	46.76	28.18	.....	.....	74.94
Mississippi	1	3.50	13.25	.....	.....	16.75
Missouri	1	.16	3.85	.....	.....	4.01
Montana	1	8.51	.....	.....	.....	8.51
Nebraska	1	1.25	.....	.....	.....	1.25
Nevada	1	7.00	.....	.....	.....	7.00
New Jersey	1	.66	2.00	.....	.....	2.66
New Mexico	1	3.66	.....	.....	.....	3.66
New York	3	2.84	13.84	9.27	15.97	41.92
North Carolina	3	33.30	39.90	.....	.....	73.20
North Dakota	2	26.29	.....	.....	.....	26.29
Ohio	3	9.30	7.26	.....	.....	16.56
Oklahoma	3	34.74	.....	.....	.....	34.74
Oregon	4	82.70	.....	.....	.....	82.70
Pennsylvania	9	98.37	44.86	26.25	11.94	181.42
Rhode Island	..	.....	.....	.62	.65	1.27
South Carolina	..	.....	1.00	.....	.....	1.00
Tennessee	4	12.15	18.71	.....	.....	30.86
Texas	2	4.40	.50	.....	.....	4.90
Utah	1	14.95	7.76	.....	.....	22.71
Virginia	2	17.80	81.03	.....	.....	98.83
Washington	6	70.88	9.27	.....	.....	80.15
West Virginia	7	13.78	1.32	.....	.....	15.10
Wisconsin	1	29.32	7.78	.....	.....	37.10
Wyoming	1	7.37	.....	.....	.....	7.37
Total	104	933.24	356.28	36.14	28.56	1,354.22
Canada	17	718.37	.84	.....	.....	719.21
Mexico	2	36.50	.....	.....	.....	36.50

New Track Built in 1914

United States—	No. Cos. building	Miles: First track	Second track	Third track	Fourth or more track	Total
Alabama	4	1.00	33.81	.....	.....	34.81
Arkansas	5	27.10	.50	.....	.....	27.60
California	9	103.91	18.94	.....	.....	122.85
Connecticut	1	.....	2.10	.....	.....	2.10
Delaware	2	1.15	.....	.....	1.00	2.15
Florida	7	220.46	.....	.....	.....	220.46
Georgia	5	14.66	7.84	.....	.....	22.50
Idaho	3	117.22	12.89	.....	.....	130.11
Illinois	6	3.17	9.24	1.61	2.29	16.31
Indiana	4	12.80	13.15	.....	2.26	28.21
Iowa	4	26.16	110.00	.....	.....	136.16
Kansas	2	11.00	.49	.....	.....	11.49
Kentucky	4	31.57	16.68	.....	.....	48.25
Louisiana	3	7.79	.....	.....	.....	7.79
Maine	2	.21	.61	.....	.....	.82
Maryland	2	.....	12.14	.....	.....	12.14
Massachusetts	2	.....	.13	1.50	1.35	2.98
Michigan	4	18.81	.....	.....	.....	18.81
Minnesota	2	8.42	.....	.....	.....	8.42
Mississippi	2	19.15	.....	.....	.....	19.15
Missouri	4	4.32	4.89	1.70	2.10	13.01
Montana	2	48.13	2.00	.....	.....	50.13
Nebraska	1	.88	.....	.....	.....	.88
Nevada	3	10.01	.70	.....	.....	10.71
New Jersey	2	.80	.....	1.16	4.53	6.49
New Mexico	2	29.47	.....	.....	.....	29.47
New York	6	10.45	9.90	.68	.....	21.03
North Carolina	5	34.00	71.61	.....	.....	105.61
North Dakota	4	63.24	4.33	.....	.....	67.57
Ohio	8	17.05	28.30	.....	.....	45.35
Oklahoma	1	4.00	5.00	.....	.....	9.00
Oregon	7	90.42	2.30	.....	.....	92.72
Pennsylvania	12	62.74	.97	.47	5.35	69.53
Rhode Island	1	.....	.....	.66	.66	1.32
South Carolina	2	66.60	.....	.....	.....	66.60
South Dakota	1	41.30	.....	.....	.....	41.30
Tennessee	4	11.21	45.56	.....	.....	56.77
Texas	6	50.86	.80	.....	.....	51.66
Utah	1	41.95	.....	.....	.....	41.95
Virginia	7	66.05	74.00	.....	.....	140.05
Washington	6	142.73	61.30	2.31	.....	206.34
West Virginia	4	19.80	5.99	.....	.21	26.00
Wisconsin	3	29.78	9.41	.....	.....	39.19
Wyoming	1	61.43	.....	.....	.....	61.43
Total	166	1,531.80	565.58	10.09	19.75	2,127.22
Canada	21	1,978.07	152.50	.....	.....	2,130.57
Mexico	..	.....	.....	.....	.....	.....

FLORIDA

First Track

	Miles.	Miles.
East & West Coast—Between Bradentown and Arcadia	4.80	
Fellsmere Railroad—2.58 miles west of Fellsmere to Broadmoor	3.65	
Jacksonville Municipal Railroad—At Jacksonville	1.93	
St. Andrews Bay Railway & Terminal (A. & St. A. B.) Between Panama City and St. Andrews	2.25	
Seaboard Air Line—Lake Wales extension	23.02	
Tampa & Gulf Coast—Not specified	3.00	38.65
Total of all track		38.65

GEORGIA

First Track

Americus, Hawkinsville & Eastern—Gaines to Flint River	10.00	
Ocilla, Pinebloom & Valdosta—Lax to Gladys	8.00	
Ocilla Southern—Rochelle to Pope City	7.24	
Pelham & Havana—Calvary to Darsey, Fla	4.00	
Savannah & Southern—Willie to Duke	2.40	31.64
Total of all track		31.64

IDAHO

Second Track

Oregon Short Line—Idaho Junction to Montana Junction	1.75	1.75
Total of all track		1.75

ILLINOIS

First Track

Belt Railway of Chicago—Between Chicago and Argo	2.21	
Chicago & Illinois Midland—Taylorville west	2.85	
Manufacturers Junction—At Hawthorne	0.30	
Paducah & Illinois—Between Metropolis and Illinois-Kentucky state line	1.54	6.90

Second Track

Belt Railway of Chicago—Between Chicago and Argo	3.85	
Chicago, Burlington & Quincy—At Jacksonville, 0.02 miles; Concord to Pisgah, 0.70 miles; Centralia to Shattuc, 0.16 miles; Astoria to Adair, 17.59 miles; total	18.47	
Illinois Central—Parkway to Broadview	2.46	24.78
Total of all track		31.68

IOWA

Second Track

Chicago & North Western—Between Otis and Cedar Rapids	3.43	3.43
Total of all track		3.43

KANSAS

First Track

Anthony & Northern—Byers to Trousdale	14.00	
Atchison, Topeka & Santa Fe—At Salina	0.56	
Cudahy Packing Company's Line—From Fowler	8.00	
Salina Northern—Salina to Lincoln Center	36.00	58.56

Second Track

Kansas City Terminal—At Kansas City	0.09	
Salina Northern—Between Salina and Lincoln	4.00	4.09
Total of all track		62.65

KENTUCKY

First Track

Louisville & Nashville—Winchester to Ravenna, 26.69 miles; Typo to Harveyton, 5.29 miles; Lothair to Buffalo Creek, 1.37 miles; Lothair to Ashless, 0.39 miles; Ages to Kildav, 1.59 miles; total	35.33	
Paducah & Illinois—Between Paducah and Kentucky-Illinois state line	12.43	
Tug River & Kentucky (N. & W.)—Not specified	1.13	48.89

Second Track

Illinois Central—At Paducah, 1.10 miles; Princeton to Dulaney, 5.82 miles; total	6.92	6.92
Total of all track		55.81

MAINE

First Track

Sandy River & Rangeley Lakes—Eustis branch to Langtown plantation	1.33	1.33
Total of all track		1.33

MARYLAND

First Track

Baltimore & Ohio—On Magnolia Cut-off	0.58	
Western Maryland—Charlton to Maryland-West Virginia state line	2.82	3.40

Second Track

	Miles.	Miles.
New York, Philadelphia & Norfolk—Pokomoke to Maryland-Virginia state line	4.95	4.95
Total of all track		8.35

MASSACHUSETTS

First Track

Boston, Revere Beach & Lynn—Not specified	1.00	
South Boston Industrial Track—In South Boston	1.00	2.00
Total of all track		2.00

MICHIGAN

First Track

Boyne City, Gaylord & Alpena—Atlanta east	7.50	
Detroit, Bay City & Western—Sandusky to Peck	11.00	18.50

Second Track

Detroit & Toledo Shore Line—River Rouge to Dearoad	1.00	1.00
Total of all track		19.50

MINNESOTA

First Track

Duluth & Northern Minnesota—Echo to Harlan	13.00	
Electric Short Line—Winsted to Hutchinson	18.25	
Minneapolis, St. Paul, Rochester & Dubuque, Electric—Minneapolis to Auto Club	14.62	
Northern Pacific—Cuyuna Northern branch connections	0.89	46.76

Second Track

Chicago, Milwaukee & St. Paul—Hopkins to Cologne	24.00	
Minneapolis, St. Paul, Rochester & Dubuque Electric—Minneapolis to Luce Line Junction, Minneapolis	3.24	
St. Paul Bridge & Terminal—At St. Paul	0.94	28.18
Total of all track		74.94

MISSISSIPPI

First Track

Meridian & Memphis—From Alabama-Vicksburg Junction into Meridian terminals	3.50	3.50

Second Track

Alabama Great Southern—Russell to Meridian	10.65	
Yazoo & Mississippi Valley—Lake Cormorant to Marinette	2.60	13.25
Total of all track		16.75

MISSOURI

First Track

Missouri Pacific—At Sheffield	0.16	0.16

Second Track

Kansas City Southern—Mile post 159 to mile post 163 (Saginaw Cut-off)	3.75	
Kansas City Terminal—At Kansas City	0.10	3.85
Total of all track		4.01

MONTANA

First Track

Northern Pacific—State line to Ollie	8.51	8.51
Total of all track		8.51

NEBRASKA

First Track

Chicago, Burlington & Quincy—Between Chalco and Yutan	1.25	1.25
Total of all track		1.25

NEVADA

First Track

Nevada Short Line—Between Oreana and Upper Rochester	7.00	7.00
Total of all track		7.00

NEW JERSEY

First Track

Pennsylvania Railroad—South Gloucester to Gloucester	0.66	0.66

Second Track

Raritan River—Parlin to South River	2.00	2.00
Total of all track		2.66

NEW MEXICO

First Track

Arizona & New Mexico—Lordsburg to Eighty-Five mine	3.66	3.66
Total of all track		3.66

NEW YORK

First Track

	Miles.	Miles.
Grasse River—Cranberry Lake towards Carthage and Adirondack branch New York Central	1.00	
New York Central—Through Beacon (relocation)	0.54	
New York Connecting—In Astoria	1.30	2.84

Second Track

Delaware, Lackawanna & Western—Jamesville to Syracuse	4.59	
Erie—Allegheny to Carrollton	5.80	
New York Central—Between Nepperham and Gray Oaks, 0.61 miles; Through Beacon (relocation) 2.24 miles; total	2.85	
New York Connecting—In Astoria	0.60	13.84

Third Track

New York Central—Between Hyde Park and Lacey's Middle, 3.70 miles; Between Tivoli and Germantown, 4.24 miles; Through Beacon, 1.33 miles; total	9.27	9.27

Fourth Track

New York Central—Between Hyde Park and Lacey's Middle, 3.70 miles; Between Tivoli and Germantown, 5.17 miles; Through Beacon, 0.90 miles; total	9.77	
New York, New Haven & Hartford—At Woodlawn Junction	0.60	10.37

Fifth Track

Long Island—Between Winfield Junction and Woodside	2.30	2.30

Sixth Track

Long Island—Between Winfield Junction and Woodside	3.30	3.30
Total of all track		41.92

NORTH CAROLINA

First Track

Beulaville Railroad—Pink Hill to Beulaville	9.00	
Virginia-Carolina—Between state line and Elkland	20.00	
Watauga & Yadkin River—Denny to Darby	4.30	33.30

Second Track

Beulaville Railroad—Between Pink Hill and Beulaville	2.00	
Southern Railway—Pelham to Denim	37.90	39.90
Total of all track		73.20

NORTH DAKOTA

First Track

Minneapolis, St. Paul & Sault Ste. Marie—Van Hook to Sanish	8.90	
Northern Pacific—Beach to state line	17.39	26.29
Total of all track		26.29

OHIO

First Track

Dayton, Lebanon & Cincinnati Railroad & Terminal—Lebanon Junction to Cleveland	1.61	
Lake Erie & Eastern—Between P. Y. & A. crossing and crossing No. 4	7.05	
Pittsburgh & Lake Erie—Struthers to P. Y. & A. crossing	0.64	9.30

Second Track

Baltimore & Ohio—From Piedmont	2.81	
Lake Erie & Eastern—Between P. Y. & A. crossing and crossing No. 4	2.69	
Norfolk & Western—Not specified	0.25	
Pittsburgh & Lake Erie—Struthers to P. Y. & A. crossing	0.64	
Toledo Terminal—Consaul street to Ironville	0.87	7.26
Total of all track		16.56

OKLAHOMA

First Track

Beaver, Mead & Englewood—Between Beaver and Forgan	7.00	
Clinton & Oklahoma Western—Hammon Junction to Hammon	0.79	
Oil Fields & Santa Fe (A., T. & S. F.) Cushing to Dumright and Frey to Jennings	26.95	34.74
Total of all track		34.74

OREGON

First Track

Oregon-Washington Railroad & Navigation Co.—Messner (formerly Coyote Junction) to Hinkle, 19.80 miles; Juntura to Riverside, 19.10 miles; total	38.90	
Southern Oregon Traction (Rogue River Valley)—In Medford	1.00	
Valley & Siletz—Crisp to Luckiamute river	5.00	
Willamette Pacific (So. Pac.)—From near Acme to north of Umpqua river, 23.30 miles; from 2 miles north of Northlake or 10 miles south of Umpqua river to North Bend, 14.50 miles; total	37.80	82.70
Total of all track		82.70

PENNSYLVANIA

First Track

	Miles.	Miles.
Baltimore & Ohio—North Fork to Beesercher, 2.18 miles; Strum to Bowood Mine, 3.16 miles; total	5.34	
Central of New Jersey—Near Easton from Hope to terminus	4.45	
Delaware, Lackawanna & Western—Clarks Summit to Hallstead (relocation)	39.43	
Indian Creek Valley—Not specified	1.00	
Lehigh & New England—Hauto to Nesquehoning	2.07	
Montour Railroad—North Star Junction to Longview Junction	30.70	
Pennsylvania Railroad—Between Philadelphia and Pittsburgh	12.83	
Philadelphia & Reading—Nicetown Junction to Newtown Junction	1.84	
Pittsburg & Shawmut—Cadogan to end of track	0.71	98.37

Second Track

Bessemer & Lake Erie—Cunningham to Culmerville	1.61	
Delaware, Lackawanna & Western—Between Clarks Summit and Hallstead (relocation)	39.43	
Pennsylvania Lines West—At Pittsburgh	0.79	
Pennsylvania Railroad—Between Philadelphia and Pottsville	1.20	
Philadelphia & Reading—Nicetown Junction to Newtown Junction	1.83	44.86

Third Track

Delaware, Lackawanna & Western—Between Clarks Summit and Hallstead	21.92	
Pennsylvania Lines West—Dinsmore to Hanlin	3.98	
Pennsylvania Railroad—At Philadelphia	0.35	26.25

Fourth Track

Delaware, Lackawanna & Western—Between Clarks Summit and Hallstead	11.59	
Pennsylvania Railroad—At Philadelphia	0.35	11.94
Total of all track		181.42

RHODE ISLAND

Third Track

New York, New Haven & Hartford—Pawtucket to Central Falls	0.62	0.62

Fourth Track

New York, New Haven & Hartford—Pawtucket to Central Falls	0.65	0.65
Total of all track		1.27

SOUTH CAROLINA

Second Track

Orangeburg Railway—Wolfton to Sheriff siding	1.00	1.00
Total of all track		1.00

TENNESSEE

First Track

Memphis-Chattanooga Railway (So. Ry.)—Chattanooga to Wauhatchie Railway	2.88	
Oneida & Western—Toomey to Bib South Fork bridge	4.50	
Tennessee Railway—Charley's Branch to Double Camp	2.00	
Wauhatchie Railway (So. Ry.)—Wauhatchie to connection with Memphis-Chattanooga Railway at point west of Chattanooga	2.77	12.15

Second Track

Cincinnati, New Orleans & Texas Pacific—Robbins to H. F. tower	8.20	
Louisville & Nashville-South Nashville to Mayton	4.01	
Memphis-Chattanooga Railway (So. Ry.)—Chattanooga west to Wauhatchie Railway	2.88	
Nashville, Chattanooga & St. Louis—In yard at Chattanooga	0.85	
Wauhatchie Railway (So. Ry.)—Wauhatchie to connection with Memphis-Chattanooga Railway at point west of Chattanooga	2.77	18.71
Total of all track		30.86

TEXAS

First Track

Fort Worth Belt—In Fort Worth	0.16	
Roby & Northern—North Roby to Roby	4.24	4.40

Second Track

Roby & Northern—North Roby to main line	0.50	0.50
Total of all track		4.90

UTAH

First Track

San Pedro, Los Angeles & Salt Lake—Delta to Lucerne	14.95	14.95

Second Track

Union Pacific—Devils Gate Bridge to Riverdale	7.76	7.76
Total of all track		22.71

VIRGINIA

First Track

	Miles.	Miles.
Carolina, Clinchfield & Ohio—Bear Hollow to south end Sandy Ridge Tunnel	5.30	
Virginia-Blue Ridge—Nelmont to Woodson	12.50	17.80
Second Track		
Chesapeake & Ohio—Between Greenlee and Balcony Falls	3.00	
New York, Philadelphia & Norfolk—Maryland-Virginia state line to New Church	1.67	
Norfolk & Western—Burkeville to Pamplin, 36.93 miles—Not specified; 11.03 miles; total	47.96	
Southern Railway—Charlottesville to Arrowhead, 7.40 miles; Elma to Tye River, 9.00 miles; Danville to Dry Fork, 12.00 miles; total	28.40	81.03
Total of all track		98.83

WASHINGTON

First Track

Chicago, Milwaukee & St. Paul—Rockdale to Keechelus	5.00	
Columbia & Nehalem River—Mile 15 to mile 23	8.00	
Goodyear Logging Company—West Callam to timberlands	6.50	
Northern Pacific—Snohomish to Everett	0.83	
Puget Sound & Willapa Harbor—Between Maytown and Raymond	28.00	
Seattle, Port Angeles & Western (C., M. & St. P.)—Port Angeles to a point near Fairmount	22.55	70.88
Second Track		
Great Northern—Between Ballard and Seattle	2.63	
Northern Pacific—Between Easton and Lester	6.64	9.27
Total of all track		80.15

WEST VIRGINIA

First Track

Baltimore & Ohio—On Magnolia Cut-off	0.56	
Horse Creek Land & Mining Company's Line—From Horse Creek branch of C. & O. to Sulphur Spring Fork	2.00	
Kanawha, Glen Jean & Eastern—Dun Loop to Klondyke	0.20	
Norfolk & Western—Alma branch extension, 1.86 miles; Widemouth branch extension, 1.83 miles; Jacobs Fork branch 5.21 miles; total	8.90	
Tug River & Kentucky (N. & W.) Not specified	0.07	
Virginian Railway—From Amigo	1.13	
Williamsport, Nessle & Martinsburg—Potomac River to Nessle	0.92	13.78
Second Track		
Virginian Railway—Elmore to Mullens	1.32	1.32
Total		15.10

WISCONSIN

First Track

Wisconsin & Northern—North of Van Ostrand to Crandon	29.32	29.32
Second Track		
Chicago, Burlington & Quincy—Ferryville to De Sota	7.78	7.78
Total of all track		37.10

WYOMING

First Track

Chicago, Burlington & Quincy—Between Guernsey and Wendover	7.37	7.37
Total of all track		7.37

CANADA

First Track

Alberta & Great Waterways (E. D. & B. C.)—In Alberta, mile 78 to mile 175	97.00	
Canadian Northern (Western Lines)—In Saskatchewan, Bienfait to Estevan, 8.91 miles; Canora to Sturgis, 21.44 miles; MacRorie Westerly branch, Elrose to Eston, 34.59 miles; Wroxton to Yorkton branch, 41.01 miles; In Alberta, Camrose southeasterly, 60 miles; total	165.95	
Canadian Northern Ontario (C. N. Eastern Lines)—Not specified	7.90	
Canadian Northern Pacific—Between Vancouver, B. C., and Yellowhead Pass	22.00	
Canadian Pacific (Western Lines)—In Alberta, Coronation northwest, 0.50 miles; Foremost to Pokowki, 22.30 miles; total	22.80	
Canadian Northern Quebec (C. N. Eastern Lines)—Not specified	5.06	
Central Canada (E. D. & B. C.)—In Alberta to Peace River Crossing	50.00	
Dominion Atlantic—In Nova Scotia, not specified	14.81	
Edmonton, Dunvegan & British Columbia—In Alberta, mile 248 to mile 357	109.00	
Essex Terminal—To Ojibway, Ont	1.00	
Grand Trunk Pacific—In Saskatchewan, Prince Albert branch mile 83 to mile 87	4.00	
Hudson Bay Railway—In Manitoba, not specified	44.00	
Intercolonial—Not specified	0.85	
Kettle Valley—Osprey Lake, B. C. to Princeton, 31.00 miles; Coquehala branch 33.00 miles; total	64.00	
Pacific Great Eastern—D'Arcy, B. C., to Clinton	82.00	
Quebec Central—From 5 miles east of St. Camille, Que., to English Lake	14.00	
Winnipeg & Northern (Can. Nor.)—Grand Marais, Man., to Victoria Beach	14.00	718.37

CANADA—Continued.

Second Track

	Miles.	Miles.
Essex Terminal—Near Windsor, Ont	0.84	0.84
Total of all track		719.21

MEXICO

First Track

San Diego & Arizona—Lower California from 2.6 miles east of Tecate to Mexican-United States boundary	4.50	
Tampico & Panuco Valley—In Vera Cruz, between Tampico and Panuco	32.00	36.50
Total of all track		36.50

THE AGITATOR AND THE LAKE LINES

[From the Northwestern Miller.]

The Lehigh Valley Railroad Company has petitioned the Interstate Commerce Commission for a rehearing on its application to be allowed to continue its lake service, which, in common with that of other railways operating lines on the lakes, was ordered stopped because the commission held that such service violated the terms of the Panama Canal act.

This act, commonly supposed to apply specifically to lines operating through the Panama Canal, was given general application by the simple inclusion of two words "and elsewhere," thus bringing under its provisions the Great Lakes, according to the ruling of the Interstate Commerce Commission, a result no doubt never contemplated by the majority of those who voted for the measure in Congress, believing it to be intended only for regulating traffic through the canal.

Taking advantage of this opportunity, the Interstate Commerce Commission promulgated a ruling which is one of the most preposterously destructive acts ever perpetrated by this body, totally disrupting and destroying an established system of lake transportation, which has been of incalculable benefit to the Western shipper and receiver, in the hope of encouraging an imaginary system of so-called "independent" transportation, which, by a disjointed and disconnected service, is to accomplish what the commission considers "competition," but which actually would be a state of irresponsible chaos. Thereby it is the desire of the commission to turn backward the wheels of progress to a system of transportation which was out of date 25 years ago.

In its interpretation of the meaning of the act, the commission is doubtless sincere, believing that in some mysterious way an independent system will come into being which shall give shippers the benefit of a competition which they do not at present have, and cannot, under existing conditions, obtain.

The commission has been led into this belief by the persistent outcry of the paid agitators employed by certain associations and trade organizations. For some time actual shippers have been aware that, on the whole, the work of these agitators has been mischievous and even dangerous, but they were powerless to restrain them; the machinery for their employment having been put in operation, no way is provided either for directing them wisely or suppressing them altogether.

The civic organizations that support and keep in motion these "experts" rarely represent the real shippers either by their membership or their published sentiments. Mostly they are composed of real estate operators, local bankers, retailers and a vast conglomeration of clerks, salesmen and subordinates, who like to imagine themselves representative citizens. Shippers who have a large and comprehensive view of traffic matters have long since withdrawn their support.

Such influences as these, which really signify nothing but a distorted sense of local patriotism, are responsible for the hue and cry raised against the railway-controlled lake lines which are now threatened with extinction. To these the Interstate Commerce Commission has evidently listened—not wisely but too well. If its ruling is not reversed, the Western shipper and receiver, now so dependent upon lake transportation, will find themselves facing a situation nothing short of calamitous in the very near future. For this they may thank the walking delegates of their local trade-unions, whether or not they themselves are members in good standing.

Mileage of American Railroads Block Signaled

Space Interval in Use on Nearly One Hundred Thousand Miles. Another Thousand, Automatic, Planned for

The mileage of railroad in the United States operated under the block system on January 1, 1916, as shown in the large table printed herewith is 97,809 miles. The increase over the total given in our table printed one year ago is 9,677 miles. As is well known, however, the manual black system is used on a large mileage of single track lines for the protection only of passenger trains and the more significant total is that of automatic block signal mileage; of this we record now 31,160 miles of road as compared with 29,689 miles in the table for January 1, 1915. The increase in automatic mileage during the past 12 months is comparatively small, as might have been expected.

As in former years, a considerable portion of the new automatic mileage consists of signals installed on lines where the manual system had been in use, and the total length of road worked under the space interval system, automatic and non-automatic together, is not increased by such items; but in 1915 there has been a net increase of 8.206 miles in manual block signal mileage.

The detailed comparison of the totals of the *Railway Age Gazette* tables for the four years last past is as follows:

Miles of Road Worked by the Block System

	—Automatic—		—Manual—		—Total—	
	Jan. 1	Increase over prev. year	Jan. 1	Increase over prev. year	Jan. 1	Increase over prev. year
1916.....	31,160	1,471	66,649	8,206	97,809	9,677
1915.....	29,689	3,566	58,443	Decrease	88,132	943
1914.....	26,123	3,827	61,062	5,127	87,185	8,954
1913.....	22,296	1,961	55,935	Decrease	78,231	1,821

These figures are to be understood with the usual conditions, with which the reader is familiar. A number of roads exclude from their statement of total mileage operated all lines on which there is regularly in service only one locomotive, and also lines on which only freight trains are run. Among the roads thus reporting are the Baltimore & Ohio, the Chesapeake & Ohio, the Chicago, Burlington & Quincy, the Chicago, Milwaukee & St. Paul, the New York Central, the Pennsylvania and the Southern Pacific. A number of roads have long sections of road used exclusively for freight trains which are equipped with automatic block signals; notably the Pennsylvania, the Erie and the Lehigh Valley.

The Panama Railroad is operated throughout by the block system, nearly all automatic.

Canada.—The block system is operated in Canada on 8,787 miles of road, of which 611 miles is automatic, as shown in the small table. In the Canadian manual mileage there is included 75 miles worked by train staff.

Lines in Canada Worked by the Block System

	Automatic miles of road	Manual miles of road	Total miles of road
Canadian Government, Intercolonial.....	43	.....	43
Canadian Pacific, East of Fort William.....	222	4,535	4,757
Canadian Pacific, Western Lines.....	34	18	52
Dominion Atlantic †	...	273	273
Grand Trunk	5	3,350	3,355
Michigan Central	245	.....	245
Toronto, Hamilton & Buffalo.....	62	.....	62
	611	8,176	8,787

† No report received. Figures repeated from last year.

PLANS FOR 1916

Roads which have given information concerning proposed new work, including both block and interlocking signals, for next year, are not so numerous as one year ago, but it is to be noted that most of the large roads have given no information on this point; they say that their plans are not yet settled. One road intends, during 1916, to equip 400 miles of line with automatic block signals (in place of manual); but is not yet quite ready to have the figures appear in our list. The Long Island is the only company which plans to install any considerable length of manually operated block signals. A comparison will show that, in some cases, the expectations for 1916 are but a repetition of those formulated a year ago for 1915; but, no doubt, everybody's expectations have at the present time a better basis of facts than they had one year ago.

The Alabama Great Southern plans during the coming year to install automatic block signals on 5.4 miles of line. This number of miles is exactly the difference between the mileage reported as now operated under automatic block signals and the total mileage of road on which passenger trains are run, indicating that at the end of the year the whole of the line will be signaled.

The Atchison, Topeka & Santa Fe plans during the coming year to install automatic block signals on seven miles of its line, double track, between Standish, Mo., and Carrollton; ten miles, double track, between Le Loup, Kan., and H. U. Tower and between Claremont, Cal., and Arcadia, 20 miles, single track. Of these three installations, the two last named have already been begun. During 1916, the company proposes to install electric interlocking, 36 levers, at Arcadia, Cal., jointly with the Southern Pacific and the Pacific Electric, and at Los Angeles, Cal., electric interlocking, 80 levers, jointly with the Salt Lake Route and the Southern Pacific.

The Atlantic Coast Line reports that the length of road equipped with automatic block signals, given in the table as 252 miles, will soon be increased to 320, signals having been nearly completed on 68 miles (double track), but not yet put in operation.

The Boston & Maine is to install an electro-mechanical interlocking at Newburyport, Mass.; 20 mechanical and 7 electric levers.

The Chesapeake & Ohio plans during the coming year to install automatic block signals on 8 miles of its line, double track, and 21 miles single track.

The Chicago & Northwestern plans during the coming year to put in an electric interlocking plant at Deering, Ill., of 44 levers. This is at the crossing of the Chicago river. Another electric interlocking of 100 working levers is to be put in at Washington street, Milwaukee, to take the place of two mechanical interlockings.

The Chicago, Indianapolis & Louisville is to install mechanical interlocking at the crossing of its line with the Grand Trunk at Haskells, Ind. The machine will have 25 levers and the distant signals will be power operated.

The Chicago, Milwaukee & St. Paul, on its electrified line between Butte, Mont., and Finlen, Mont., 16 miles, will install light signals, automatic, in place of manual block signals; and this work together with 39 miles, in the same vicinity, which has already been changed from automatic semaphore signals will make 55 miles of road equipped with light signals.

The plans of the Chicago, Rock Island & Pacific for the ensuing year include the installation of automatic block signals on five miles of road, double track.

The Cincinnati, Hamilton & Dayton plans to install automatic block signals on 21 miles of its line, double track, during 1916; and an additional length of 6 miles will be changed from single track to double track.

The Cleveland, Cincinnati, Chicago & St. Louis contemplates the installation of automatic block signals during the coming year on its line from Bellefontaine, Ohio, to Anderson, Ind., 106 miles, single track.

The Cumberland Valley proposes during the coming year to install automatic block signals on its line near Berkeley, six miles, single track.

The Erie will install automatic block signals in 1916, in place

LENGTH OF RAILWAYS IN THE UNITED STATES WORKED BY THE BLOCK SYSTEM, JANUARY 1, 1916

Name of Road	Miles of Road — Automatic — Single track	Automatic — Two or more tracks	Automatic — Total	Non-automatic — Single track	Non-automatic — Two or more tracks	Non-automatic — Total	Total both kinds	Total passenger lines operated	Percentage of total block signaled
Albany Southern†	...	...	...	27	16	43	43	43	100
Ann Arbor	...	...	...	1	...	1	1	294	...
Arizona & New Mexico	1	...	1	...	...	...	1	110	...
Atchison, Topeka & Santa Fe (including Gulf, Col. & Santa Fe)	126	444	570	1,021	507	1,528	2,098	9,640	21
Atlanta & West Point	...	...	...	...	6	6	6	86	13
Atlantic Coast Line	11	241	252	141	12	153	405	3,810	11
Baltimore & Ohio	39	374	413	1,921	771	2,692	3,105	3,105	100
Baltimore & Ohio Chicago Terminal	1	20	21	...	...	...	21	43	50
Baltimore & Ohio Southwestern	35	25	60	867	36	903	963	963	100
Cincinnati, Hamilton & Dayton	19	35	54	447	19	466	520	547	95
Staten Island	...	24	24	...	...	...	24	24	100
Baltimore, Chesapeake & Atlantic†	...	...	...	87	...	87	87	87	100
Bangor & Aroostook	6	...	6	...	1	1	7	622	...
Bessemer & Lake Erie†	...	...	...	65	130	195	195	191	100
Boston & Maine	550	624	1,174	...	...	...	1,174	2,213	53
Boston Elevated (Rapid Transit Lines)	...	17	17	...	...	...	17	...	...
Boston, Revere Beach & Lynn	...	14	14	...	...	...	14	14	100
Buffalo, Rochester & Pittsburgh	140	83	223	175	41	216	439	408	...
Butte, Anaconda & Pacific	8	...	8	...	...	...	8	58	14
Canadian Pacific	...	...	...	200	...	200	200	200	100
Carolina & North Western	...	...	...	2	...	2	2	133	...
Carolina, Clinchfield & Ohio	13	...	13	...	...	...	13	282	5
Central New England	1	36	37	...	37	37	74	300	24
Central of Georgia	...	2	2	48	7	55	57	1,767	3
Central of New Jersey	41	201	242	...	...	...	242	460	52
Central Vermont	...	...	...	396	6	402	402	402	100
Cherrytree & Dixonville	...	...	...	31	...	31	31	31	100
Chesapeake & Ohio	...	455	455	1,395	21	1,416	1,871	1,895	...
Chesapeake Beach	...	...	...	2	...	2	2	28	...
Chicago & Alton	411	188	599	106	37	143	742	1,052	71
Chicago & Eastern Illinois	58	154	212	181	31	212	424	1,006	42
Chicago & North Western	208	930	1,138	2,559	25	2,584	3,722	7,332	51
Chicago & Western Indiana	...	20	20	...	7	7	27	27	100
Chicago, Burlington & Quincy	159	110	269	7,923	782	8,705	8,974	8,693	100
Chicago Great Western	256	90	346	49	...	49	395	1,427	28
Chicago, Indianapolis & Louisville	294	...	294	...	...	...	294	578	51
Chicago Junction	...	...	...	1	...	1	1	...	...
Chicago, Lake Shore & South Bend	10	...	10	...	...	...	10	...	...
Chicago, Milwaukee & St. Paul	365	963	1,328	3,058	43	3,101	4,429	8,644	51
Bellingham & Northern	...	...	...	55	...	55	55	55	100
Gallatin Valley	...	...	...	48	...	48	48	48	100
Idaho & Washington Northern	...	...	...	112	...	112	112	112	100
Puget Sound & Wallapa Harbor	...	...	...	66	...	66	66	66	100
Tacoma & Eastern	...	...	...	76	...	76	76	76	100
White Sulphur Springs & Yellowstone Park	...	...	...	19	...	19	19	19	100
Chicago, Ottawa & Peoria	16	...	16	...	...	...	16	108	15
Chicago, Peoria & St. Louis	...	...	...	247	...	247	247	247	100
Chicago, Rock Island & Pacific	700	284	984	1,087	...	1,087	2,071	8,041	26
Chicago, Rock Island & Gulf†	33	...	33	...	...	...	33	469	7
Chicago, St. Paul, Minneapolis & Omaha	23	173	196	629	...	629	825	1,673	49
Chicago, South Bend & Northern Indiana†	10	...	10	...	...	...	10	...	...
Chicago, Terre Haute & Southeastern	1	...	1	...	...	...	1	178	...
Cincinnati, Indianapolis & Western	98	...	98	198	...	198	296	296	100
Colorado Midland	...	...	...	2	...	2	2	261	...
Columbia & Puget Sound	10	9	19	...	...	...	19	51	37
Copper Range†	...	...	...	79	...	79	79	79	100
Cornwall & Lebanon†	...	...	...	9	13	22	22	22	100
Cumberland & Pennsylvania†	...	...	...	4	3	7	7	31	23
Cumberland Valley	7	56	63	105	...	105	168	164	100
Delaware & Hudson	187	247	434	333	35	368	802	802	100
Delaware, Lackawanna & Western	281	539	820	9	...	9	829	960	86
Denver & Salt Lake†	...	...	...	34	...	34	34	214	16
Duluth & Iron Range†	...	17	17	...	...	...	17	200	8
Duluth, South Shore & Atlantic	...	...	...	24	...	24	24	519	...
Durham & Southern	...	...	...	57	...	57	57	59	96
Eastern Kentucky†	...	...	...	4	...	4	4	36	11
Elgin, Joliet & Eastern†	7	3	10	9	...	9	19	...	...
El Paso & Southwestern	188	...	188	...	...	...	188	817	23
Empire United (Electric)	41	6	47	1	...	1	48	135	36
Auburn & Syracuse	2	...	2	...	...	...	2	...	...
Erie (including Subsidiary Lines)	27	892	919	665	229	894	1,813	2,183	...
Fort Dodge, Des Moines & Southern	16	...	16	102	...	102	118	118	100
Ft. Wayne & Northern Indiana	51	...	51	...	...	...	51	...	...
Grand Trunk	2	99	101	867	215	1,082	1,183	1,183	100
Great Northern	189	346	535	320	...	320	855	8,326	11
Hocking Valley	...	2	2	281	...	281	281	331	85
Hudson & Manhattan	...	8	8	...	...	...	8	8	100
Huntingdon & Broad Top Mountain†	5	...	5	...	...	...	5	49	10
Illinois Central	290	474	770	9	...	9	779	4,555	17
Yazoo & Mississippi Valley	93	...	93	...	...	...	93	1,379	7
Illinois Traction	120	2	122	...	...	...	122	443	28
Interborough (New York City)	...	7	7	...	...	...	7	...	...
International (Buffalo)†	5	...	5	...	...	...	5	34	...
Kanawha & Michigan	2	...	2	2	...	2	4	164	...
Kansas City Terminal	...	7	7	...	...	...	7	...	...
Kentucky & Indiana Terminal	...	...	...	3	8	11	11	11	100
Kentwood & Eastern	...	...	...	3	...	3	3	30	10
Lackawanna & Wyoming Valley	...	...	...	1	2	3	3	23	...
Lehigh & Hudson River	73	...	73	...	...	...	73	73	100
Lehigh & New England	3	...	3	...	...	...	3	74	...
Lehigh Valley	71	519	590	593	49	642	1,232	1,218	100
Ligonier Valley	...	...	...	14	...	14	14	14	100
Long Island	1	114	115	37	17	54	169	361	47
Louisville & Nashville	213	150	363	90	53	143	506	4,793	11
Louisville & Nor. Ry. & Light	4	...	4	...	...	...	4	16	25
Maine Central	437	63	500	...	...	...	500	1,103	45
Portland Terminal	5	12	17	...	...	...	17	20	85
Maryland, Delaware & Virginia†	...	...	...	77	...	77	77	77	100
Mineral Point & Northern†	...	...	...	26	...	26	26	26	100
Mineral Range	...	...	...	5	...	5	5	77	...
Minneapolis & St. Louis	...	...	...	11	...	11	11	1,538	...
Minneapolis, St. Paul & Sault Ste. Marie	...	...	...	1,410	12	1,422	1,422	3,489	40
Missouri, Kansas & Texas	9	...	9	10	...	10	19	1,609	...
Missouri, Kansas & Texas of Texas	92	9	101	...	...	...	101	1,632	...
Missouri Pacific	59	39	98	3,527	20	3,547	3,645	3,890	94
St. Louis, Iron Mountain & Southern	120	13	133	2,676	169	2,845	2,978	3,251	92
Mobile & Ohio	5	...	5	38	...	38	43	949	...
Monongahela	...	2	2	...	...	...	2	97	...
Munising, Marquette & Southeastern	...	...	...	4	...	4	4	119	...

LENGTH OF RAILWAYS IN THE UNITED STATES WORKED BY THE BLOCK SYSTEM, JANUARY 1, 1916—Continued

Name of Road	Miles of Road: Automatic: Single track	Automatic: Two or more tracks	Automatic: Total	Non-automatic: Single track	Non-automatic: Two or more tracks	Non-automatic: Total	Total both kinds	Total passenger lines operated	Percentage of total block signaled
Nashville, Chattanooga & St. Louis	111	...	111	...	...	...	111	1,230	9
Nashville Terminals†	...	2	2	4	...	4	6	...	...
Nevada Northern	1	...	1	...	...	...	1	155	...
Newburgh & South Shore	...	...	...	...	5	5	5	...	...
New York & Long Branch	...	38	38	...	...	...	38	38	100
New York Central Lines:									
Boston & Albany	3	209	212	...	1	1	213	378	56
Cincinnati Northern	...	...	...	205	...	205	205	205	100
Cleveland, Cincinnati, Chicago & St. Louis	24	98	122	733	285	1,018	1,140	2,203	51
Lake Erie & Western	48	9	57	815	...	815	872	872	100
Lake Erie & Pittsburgh (Freight Road)	...	...	...	28	...	28	28	28	100
Michigan Central	...	272	272	872	19	891	1,163	1,163	100
New York Central, Eastern Lines	2	696	698	1,688	542	2,230	2,928	2,942	99
New York Central, Western Lines	28	574	602	1,318	63	1,381	1,983	1,998	99
Peoria & Eastern (inc. in C. C. C. & St. L.)									
Pittsburgh & Lake Erie	...	160	160	3	...	3	163	166	98
Toledo & Ohio Central	2	5	7	382	1	383	390	390	100
Zanesville & Western	1	...	1	68	...	68	69	...	...
New York, Chicago & St. Louis	146	12	158	...	...	...	158	513	31
New York, New Haven & Hartford	2	344	346	1,034	388	1,422	1,768	1,923	92
New York, Ontario & Western	49	150	199	...	...	...	199	493	40
New York, Philadelphia & Norfolk	...	9	9	33	70	103	112	112	100
Cape Charles	...	...	...	9	...	9	9	9	100
New York State Railways	72	5	77	...	...	...	77	...	...
New York, Westchester & Boston	...	18	18	...	...	...	18	18	100
Norfolk & Western	142	521	663	940	8	948	1,611	1,879	86
Northern Pacific	683	500	1,183	258	81	339	1,522	5,666	27
Northwestern Pacific	11	16	27	...	...	...	27	407	7
Oakland, Antioch & Eastern	82	...	82	...	...	...	82	99	...
Ohio Electric†	5	...	5	...	...	...	5	552	...
Ohio Valley Electric†	...	...	...	11	...	11	11	22	...
Pacific Electric	...	12	12	...	...	...	12	...	...
Pennsylvania (inc. all east of Pittsburg)	3	730	733	2,944	948	3,892	4,625	4,625	100
Grand Rapids & Indiana	...	...	...	225	2	227	227	546	41
Pennsylvania Co.	...	528	528	836	206	1,042	1,570	1,651	95
Pennsylvania Terminal (Louisville)	...	...	...	2	1	3	3	3	100
Pittsburgh, C., C. & St. Louis	...	30	30	741	621	1,362	1,392	1,415	98
Vandalia	...	...	6	303	61	364	370	782	48
Peoria & Pekin Union	...	...	...	...	6	6	6	16	...
Pere Marquette	136	11	147	...	...	...	147	1,629	9
Philadelphia & Reading	41	519	560	307	64	371	931	1,351	69
Philadelphia Rapid Transit	...	7	7	...	...	...	7	...	...
Piedmont & Northern	...	3	4	126	...	126	130	130	100
Pittsburgh, Shawmut & Northern	1	...	1	...	...	...	1	295	...
Portland Ry., Light & Power	21	...	21	...	...	...	21	76	...
Quincy, Omaha & Kansas City, and Iowa & St. Louis†	...	...	...	296	...	296	296	296	100
Queen & Crescent Route:									
Alabama & Vicksburg	78	...	78	...	...	...	78	142	54
Alabama Great Southern	249	36	285	...	...	...	285	290	98
Cincinnati, New Orleans & T. P.	197	129	326	9	...	9	335	335	100
New Orleans & Northeastern	98	15	113	...	...	...	113	196	58
Richmond, Fredericksburg & Potomac	...	19	19	10	59	69	88	88	100
St. Louis & San Francisco	708	34	742	11	...	11	753	4,749	16
Beaumont, Sour Lake & Western	...	...	...	...	...	...	...	...	...
Orange & Northwestern	...	...	...	...	...	...	...	...	...
St. Louis, Brownsville & Mexico	...	...	...	...	...	...	...	...	...
St. Louis Merchants' Bridge Terminal	...	6	6	...	1	1	7	10	7
St. Louis Southwestern (less than 1 mile)		...	...	...	...	...	...	...	...
Southern Illinois & Missouri Bridge	...	5	5	...	...	...	5	5	100
San Francisco-Oakland Terminal	...	4	4	...	...	...	4	22	...
San Pedro, Los Angeles & Salt Lake	4	...	4	...	...	...	4	1,094	...
Seaboard Air Line	...	...	...	303	10	313	313	2,828	11
Southern	18	422	440	1,747	66	1,813	2,253	6,444	35
Virginia & Southwestern	...	...	...	2	...	2	2	204	...
Southern Pacific:									
Galveston, H. & San Antonio	276	...	276	998	4	1,002	1,278	1,281	...
Houston & Shreveport	...	...	...	40	...	40	40	40	100
Houston & Texas Central	3	...	3	812	...	812	815	750	...
Houston, East & West Texas	3	...	3	188	...	188	191	191	100
Iberia & Vermilion	16	...	16	...	...	...	16	16	100
Lake Charles & Northern	...	...	...	45	...	45	45	45	100
Louisiana Western	103	...	103	93	...	93	196	...	...
Morgan's La. & Texas	95	...	95	141	40	181	276	...	...
Texas & New Orleans	113	...	113	318	1	319	432	...	...
Southern Pacific—Pacific System	2,403	414	2,817	3,588	...	3,588	6,405	6,405	100
Spokane, Portland & Seattle	...	7	7	...	...	...	7	541	...
Oregon Electric	...	7	7	...	...	...	7	154	...
Spokane & I. E. (less than 1 mile)									
United Railways	1	...	1	...	...	...	1	19	...
Terminal R. R. Ass'n of St. Louis	...	6	6	...	1	1	7	13	56
Terre Haute, Ind. & Eastern Traction	48	...	48	...	...	...	48	366	...
Texas & Pacific	1	...	1	78	...	78	79	1,937	4
Tidewater Power Co.†	...	...	...	6	...	6	6	11	...
Toledo, Peoria & W. (less than 1 mile)									
Toledo, St. Louis & Western	...	...	...	188	...	188	188	450	42
Ulster & Delaware†	24	...	24	...	...	...	24	130	18
Union (Pa.) (less than 1 mile)									
Union Pacific	653	819	1,472	11	...	11	1,483	3,588	41
Oregon Short Line	519	105	624	...	...	...	624	2,199	28
Oregon-Washington R. R. & N. Co.	599	28	627	1	...	1	628	2,019	31
Union Traction Company of Indiana	50	...	50	...	...	...	50	363	...
Virginia & Kentucky (less than 1 mile)									
Virginian	...	...	...	13	...	13	13	484	...
Wabash	89	95	184	2,079	256	2,335	2,519	2,519	100
Wabash-Pittsburgh Terminal	...	4	4	...	...	...	4	63	...
Washington, Baltimore & Annapolis	14	...	14	...	...	...	14	52	26
Washington Southern†	...	6	6	...	26	26	32	32	100
Washington Terminal	...	2	2	...	...	...	2	2	100
Washington Water Power Co.†	22	...	22	...	...	...	22	22	100
Western Pacific	11	...	11	...	...	...	11	941	12
Western Maryland	103	...	103	...	...	...	103	647	16
Total	14,377	16,783	31,160	59,453	7,196	66,649	97,809	...	...

† No report received; figures repeated from last year. Interboro Rapid Transit: Only the four-track line in included.

of the manual block system, on 84 miles of road, namely: Solon, Ohio, to Cleveland, 16 miles, double track; Kent, Ohio, to Leavittsburg, 27 miles, double track; Buchanan Junction, Pa., to Pymatuning, 26 miles single track and 6 miles double track; Columbus, Pa., to Niobe Junction, 9 miles. Also on the controlled line, the New York, Susquehanna & Western, automatic block signals will be installed on 14 miles, double track, to take the place of the manual block system.

The El Paso & Southwestern proposes to install automatic block signals this year on its line between Lee, Ariz., and Moores Spur, Ariz., 25 miles.

The Great Northern Railway plans to install during the coming year automatic block signals on 200 miles of its line. The plans for the year include also the installation of a 22-lever interlocking plant at Aberdeen, S. D., where the line crosses the Chicago, Milwaukee & St. Paul; and a nine-lever interlocking at Calumet, Minn., where the line crosses the Duluth, Missabe & Northern.

The Illinois Central plans to install automatic block signals during the coming year on 180 miles of its lines, as follows: Gilman, Ill., to Mattoon, 90 miles, double track; Dugan, Ky., to Cecilia, 8 miles; East View to Leitchfield, Ky., 14 miles; Horse Branch, Ky., to Beaver Dam, 12 miles; Rockport, Ky., to Mercer, 12 miles, and Eddyville, Ky., to Paducah, 35 miles, all single track; Woodstock, Tenn., toward Memphis, 8 miles, single track; and Branch Junction, Ill., to Centralia, 2 miles, double track.

The Interboro Rapid Transit Company, New York City, will install automatic block signals on 30 miles of track during 1916. This is the centre track, now being built, which will change the principal parts of the elevated lines in Manhattan from two-track to three-track road. These new tracks will be signaled for the movement of trains in both directions. The company also plans to install 17 electro-pneumatic interlocking plants, nine on the Manhattan Elevated lines and eight on the extensions to the subway line. One of these machines will have 107 levers, and others range from 55, 39, 31, down to 7 levers each.

The Long Island Road during 1916 plans to install the manual block system on 58.4 miles of line.

The Monongahela Railway proposes to install during the coming year automatic block signals on its line, single track, from South Brownsville, Pa., to the West Virginia line, 33 miles.

The plans of the New York, New Haven & Hartford for 1916 include extensive reconstruction on the New York division, four-track, between New Haven and South Mt. Vernon, as heretofore announced. From Stamford to South Mt. Vernon, 20 miles, the controlled manual system is to be abandoned and a complete system of automatic signals put in, to be worked by alternating-current apparatus, and the signal aspects to be in the upper left-hand quadrant. On the eastern part of the division, New Haven to Stamford, 40 miles, automatic signals are already in service, but these will be changed from two-arm, two-position, to one-arm, three-position; and the semaphores will work in the upper left-hand quadrant.

In connection with these changes in the block signaling, a number of new interlockings will be installed. At Stamford an electric interlocking, type F, with 53 levers, will be installed in the place of two large mechanical plants. New electro-mechanical plants will be installed at Cos Cob drawbridge, at Greenwich, and at Rye, each to have a 16-lever frame. Five manual block stations will be discontinued. New electro-mechanical interlockings, 16 levers each, will be put in at Greens Farms and at Westport drawbridge.

The New York, Ontario & Western plans to install a mechanical interlocking, 56 levers, at Campbell Hall, N. Y. This plant was included in the estimates for 1915, but it was not built.

The Norfolk & Western plans during the coming year to install automatic block signals on 62 miles of line, as follows: On the new line now under construction between Burkeville, Va., and Pamplin, 37 miles; and on lines now operated under the manual block system, 25 miles, as follows: Poe to Jack, Jack to Church Road, Pepper to Belspring and Pembroke to Ripplemead. The company proposes also to install four electric interlocking plants: Burkeville, Va., 15 working levers, A. C.; Pamplin, Va., 33 working levers, A. C.; Jack, Va., 19 working levers, A. C.; and Low Grade Tunnel, Va., 26 working levers, D. C. At City Point, Va., an electro-mechanical plant is to be installed, 11 mechanical and 5 electric levers.

The San Pedro, Los Angeles & Salt Lake plans to install automatic block signals during the coming year on its line between Los Angeles and Riverside, 58 miles. A manual interlocking plant is being put in at Magnolia avenue, Riverside, where the line is crossed by the Pacific Electric Railway. This machine will have 12 levers.

The Southern Railway proposes during 1916 to install automatic block signals on 178 miles of its line. The plans for the coming year include also two large mechanical interlocking plants; one at Charlottesville, Va., 48 levers, and one at Danville, Va., 40 levers.

The Southern Pacific's plans for new work during the coming year include three interlocking machines, Saxby & Farmer, 8 levers each, at three drawbridges in Oregon.

The Sunset Central Lines propose during 1916 to install two mechanical interlocking plants; one at Bellaire Junction, crossing the San Antonio & Aransas Pass, 13 levers; and one at San Antonio at the crossing of the same road, 16 levers.

The Wabash Railway plans during the coming year to install automatic block signals on 43 miles of its road, single track.

The Western Maryland proposes during the coming year to install automatic block signals on 106 miles of its line.

FREIGHT EMBARGOES STILL IN EFFECT

The committee of railroad officers which is watching the freight situation at New York City reports this week that the embargoes have begun to produce some relief, but the congestion is still very great, and some new embargoes have been placed. The number of loaded cars awaiting delivery at and near New York, and on the way from the western termini of the Trunk Lines rose before Christmas to about 50,000, or 10,000 more than the number thus on hand and detained when the committee began its work; but there has since been some reduction. The Pennsylvania extended its embargo on eastbound freight to include shipments originating on its own lines; but made an exception of foodstuffs, livestock and perishable freight destined to New England. The congestion was aggravated by the blockade on the New Haven Road, due to the snowstorm. The effect of the congestion at the Atlantic seaboard is felt at Chicago and even farther west, and many shipments are held back by lack of box cars.

The Chesapeake & Ohio has removed its embargo on export oats at Newport News, but has now embargoed wheat. The Pennsylvania has been releasing 1,000 cars a day at Philadelphia and Baltimore, and it is hoped to remove the embargoes there early in January.

A heavy movement of grain at western primary markets continues, but scarcity of cars is a factor in reducing the deliveries.

On December 24 the New York Central extended its embargo to all export freight. This road now has about 350 barges and lighters in service in New York harbor, or nearly double its normal quota. Within the last 18 months it has chartered 180 extra barges. On December 26 the New York, New Haven & Hartford, largely on account of storms, embargoed everything except coal, food and perishable freight for all points in its Western district, except Hartford and the junctions of the Boston & Albany.

On Tuesday of this week, December 28, the Pennsylvania removed its embargo on domestic freight for New York and Brooklyn. In New York City, coal dealers begin to threaten an advance in prices owing to scarcity, and contractors using large quantities of cement and structural steel fear they will have to suspend work because of non-receipt of supplies.

ENGLISH RAILWAY MEN AND THE WAR.—The National Union of Railway Men has already lost over 1,020 members by death in the war.

General News Department

The Lehigh Valley has advanced the pay of car inspectors from 19 cents an hour to 22 cents.

Beginning with January the railroads of Texas, in accordance with a new law, will pay their employees twice a month.

The Interstate Commerce Commission announces a hearing at Washington, January 26, for further argument on questions relating to physical valuation of railroads.

The American Museum of Safety, New York City, has awarded to the Hudson & Manhattan Railroad (New York, Jersey City and Hoboken) the Travelers' Insurance Company medal for good results in prevention of accidents.

Southbound passenger train No. 1 of the Kansas City Southern was stopped by robbers on the morning of December 16 near Eagleton, Ark., and a safe in the express car was blown open, and the mail car robbed of the registered mail. The passengers were not molested.

At Middletown, Conn., December 22, Antonio Vernaie and Paul Karuba pleaded guilty to the charge of wrecking a passenger train on the New York, New Haven & Hartford at Maromas, Conn., in August, 1911, and were sentenced to imprisonment for from 5 to 15 years. The men are already serving prison sentences for other crimes.

The Pullman Company has announced that, effective on January 1, it will increase the pay of its conductors and porters and miscellaneous employees in its operating department by approximately 10 per cent. This will amount to an increase in payroll of about $600,000 a year, and will affect about 9,000 conductors and porters.

The Chicago, Burlington & Quincy has completed work on the Wendover cut-off and has opened it for freight traffic. The cut-off is about 8½ miles long, extending from Guernsey, Wyo., to Wendover, and is one of the units in the Omaha-Montana short line which, when completed, will mean a "water grade" from the Rocky mountains to the Missouri river.

The College of Engineering of the University of Illinois has received a Mogul type locomotive from the Illinois Central. It has 19-in. by 26-in. cylinders, and weighs with its tender 206,000 lb. It was taken from service and put through general repairs before delivery to the university. The locomotive will be used under the general direction of Prof. E. C. Schmidt for instructional work in the locomotive laboratory.

The Interborough Rapid Transit Company has advanced the wages of conductors and guards 10 cents a day and has made considerable increases in the pay of different grades of motormen, those working their first year being advanced from $3 a day to $3.25. Advances have been made in the pay of train despatchers and others. Advances in pay have been announced also by the New York Railways Company, operating surface street car lines in Manhattan; by the Third Avenue (street) Railway, and by the Brooklyn Rapid Transit Company.

Mr. Cox, of Indiana, has introduced in Congress a bill to amend the Interstate Commerce law by including in the term "railroad" all bridges used by wagons, automobiles, etc., in transportation from one state to another. Mr. Dyer, of Missouri, has introduced a bill to authorize the Interstate Commerce Commission to hold competitive examinations to get men for the positions of roadmaster, foremen and certain other railroad places. Carriers would be required to fill vacancies in these positions only with persons certified by the commission.

Frank Trumbull, chairman of the board of directors of the Chesapeake & Ohio, has been made chairman of the committee on immigration recently organized by the Chamber of Commerce of the United States. Mr. Trumbull's associates on the committee are: Julius Rosenwald, Sears-Roebuck Company, Chicago, Ill.; J. F. Denechaud, chairman, Louisiana Immigration Commission, New Orleans, La.; B. J. Rothwell, president, Bay State Milling Company, Boston, Mass.; Malcolm McDowell, formerly vice-president Southern Development Company, Washington, D. C.; B. L. Winchell, traffic director, Union Pacific, Chicago, Ill.; Herbert Myrick, editor, New England Homestead, Springfield, Mass.; A. C. Weiss, publisher, Duluth Herald, Duluth, Minn. It is expected that in the near future other names will be added to the committee.

Keswick Collision

An officer of the Baltimore & Ohio calls our attention to an error in the *Railway Age Gazette* train accident record for November, printed December 24, page 1201, where a rear collision at Keswick, Va., on the Chesapeake & Ohio, November 2, is entered as occurring on the Baltimore & Ohio.

American Association of Railroad Superintendents

The executive and advisory committee of the American Association of Railroad Superintendents, at its meeting on Monday at St. Louis, decided to hold the 1916 annual meeting of the association at Memphis, Tenn., on August 16, 17 and 18. The membership of the association has more than doubled during the past year.

High Water Carries Out Falsework at the Memphis Bridge

On the night of December 23 high water carried out 418 ft. of falsework for the new Harahan bridge across the Mississippi river at Memphis, now being built by the Rock Island, the Missouri Pacific and the "Cotton Belt." This falsework was for the west or 418-ft. semi-suspended span between piers 3 and 4. Fortunately no part of the span had been erected, though the wrecking of the falsework carried with it the traveler, a mule derrick, four hoisting engines and stringers for the highway floor temporarily used as runways for the traveler. At the time of the accident the anchor arm on the east end and the 621-ft. center fixed span had been erected, although falsework is still in place under the latter. The bottom chord and the floor system for the 186-ft. cantilever arm to support the east end of the semi-suspended span were also in place on falsework and the traveler was just about to commence erection of the semi-suspended span. The falsework under the fixed span and cantilever arm did not go out. The accident is the result of unprecedented high water for this time of the year which rose from 13 ft. to 28½ ft. in a few days. The exact extent of the damage will not be known until a fall of water will permit an estimate of the salvage.

Quite a List of Reasons

In the Supreme Court of New Jersey, last week, the Erie Railroad, appealing from an order of the Public Utility Commission requiring the abolition of 15 grade crossings in Paterson within eight years, at an estimated cost of $3,000,000, argued:

That the act of 1913 is unconstitutional because it confers upon the board arbitrary power to make or refuse to make an order for the alteration of a grade crossing; provides for the taking of property for private use and for public use without just compensation; impairs the obligation of contract as existing between the railroad and the holders of its securities, between the state and the railroad and between the railroad and the Public Service Railway Company, also involved in the proceedings; constitutes an unreasonable exercise of the police power of the state; requires changes in the property of private corporations and municipalities; fails to give the Erie the alternative of eliminating the alleged danger to the public and impediment to travel by either decreasing the number of train movements or by abandoning the railroad; and impairs the powers of the equity and law courts of the state. Last, but not least, it was stated that the Erie has not the funds to carry out the provisions of the order and in all probability will not be in a position to obtain them.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings, and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1916, Atlanta, Ga.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 18-20, 1916, Chicago.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York, Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILROAD MEN'S IMPROVEMENT SOCIETY.—J. B. Curran, Erie R. R., 50 Church St., New York. Meetings, alternate Thursdays, October to May, Assembly Rooms of Trunk Line Association, 143 Liberty St., New York.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, January 27, 1916, Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF NEWARK.—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings, October to May.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Building, Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Karpen Bldg., Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

In West Virginia, where a new prohibitory law is in operation, the principal railroads are trying to carry out an order of the court forbidding the acceptance of baggage of passengers whenever the trunk or bag offered baggage contains intoxicating liquor.

The Oregon Short Line has issued an announcement that after February 15, 1916, the Ogden gateway will be closed to through passenger traffic by way of the Denver & Rio Grande. This action is in accordance with a ruling of the Interstate Commerce Commission made last summer.

The Missouri roads have filed with the State Railroad Commission an application for a rehearing of the intrastate rate case. They complain that both freight and passenger rates are too low, and ask that they be raised to the basis of the rates recently authorized by the Interstate Commerce Commission, for interstate traffic in Missouri and adjacent territory.

The annual comparative statement of lake commerce passing through the canals at Sault Ste. Marie, Mich., and Ontario for the seasons of 1914 and 1915 shows a total of 71,290,304 tons in 1915, as compared with 55,369,934 in 1914—an increase of 29 per cent. Of the freight traffic in 1915 63,548,993 tons passed through the United States canal and 7,741,311 through the Canadian canal.

At the annual meeting of the Salt Lake City Passenger Association, held on December 18, the following officers were elected: President, C. L. McFaul, district freight and passenger agent, Southern Pacific; first vice-president, F. J. Bambach, traveling passenger agent, New York Central Lines; second vice-president, R. D. Staley, traveling passenger agent, Rock Island Lines; secretary and treasurer, J. S. Earley, city passenger agent, San Pedro, Los Angeles & Salt Lake.

The following have been elected members of the railroad subdivision of the Ways and Means Committee of the Chicago Association of Commerce: Chairman, J. C. Clair, industrial and immigration commissioner, Illinois Central; vice-chairman, James Webster, assistant freight traffic manager of the New York Central Lines; F. A. Spink, traffic manager of the Chicago & Western Indiana; C. H. Caswel, general agent of the Chicago, Rock Island & Pacific; and W. H. Wharton, commercial agent, Nashville, Chattanooga & St. Louis.

The baggage and milk department of the Baltimore & Ohio has been enlarged. John P. Dugan is general baggage and milk agent, and W. E. Shetrone, an experienced dairyman, is to be traveling milk agent. The company aims to assist farmers adjacent to its lines in bettering the economic methods of selecting dairy cattle and feeding their herds. Mr. Shetrone is a graduate of Pennsylvania State College, and since his graduation has been in charge for two years of the Bradford County Cow-Testing Association, at Le Roysville, Pa. His headquarters will be at Baltimore.

Officers of the International Railways of Central America and the National Railways of Mexico are making preparations looking to the inauguration of through freight and passenger traffic between Mexico and Guatemala. They expect to run through sleeping cars between the capitals of the two countries. The Guatemala Central division of the International Railways of Central America was completed to a connection with the Pan-American division of the National Railways of Mexico at Ayutla several months ago, but on account of the bad condition of internal affairs of Mexico no interchange of cars was permitted.

IIn the United States District Court of Kansas City, Mo., December 21, a fine of $40 was imposed on the Richards & Conover Hardware Company of Kansas City, for violation of the interstate commerce law in misbilling freight as hardware when the packages contained articles which should take a higher rate. This company, with two others, was indicted by the grand jury November 12, on information filed by the Interstate Commerce Commission.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

1915 Western Rate Advance Case—Part II

Rate increases in western classification territory. Opinion by Commissioner Daniels:

Many of the schedules here in issue propose increases in carload rates on various commodities, while others propose increases in less-than-carload rates on some commodities, and still others propose charges for special transportation services, such as switching incident to storage in transit, for which no charge is now made. The general region in which the increases and additional charges are proposed is the same as that involved in the *Western Rate Advance Case* (35 I. C. C., 497). While some of the increases are proposed as part of the general increases proposed in the *Western Rate Case,* others are proposed for the purpose of removing discrimination, or to correct mistakes in tariffs. Those increases here proposed, which were intended as a part of the general increase proposed in the *Western Rate Advance Case* and also the proposed charges for special transportation services, were placed in this docket for investigation rather than in the *Western Rate Advance Case,* for the reason that the effort was made to constitute that investigation "one of the propriety of increased rates which the carriers seek to impose upon a relatively small number of articles of heavy movement in the territory affected." The testimony heard in that proceeding relating to the financial needs of the carriers was made a part of the record in this case.

The commission finds that the carriers have justified increased carload rates on agricultural implements except to points in Louisiana and on canned goods and flue lining in western trunk line territory. They have not justified proposed increased carload rates on eggs from points in Kansas and other points to southwestern points, and on cider vinegar from interstate points to Kansas and Missouri. Proposed increased carload rates on bauxite ore to certain points only are found justified. The carriers may increase their carload rates on boots and shoes, leather, and boot and shoe findings between Missouri manufacturing points and interstate points, but not their less-than-car-load rates between the same points or their carload minima on this traffic.

The carriers have also justified proposed increased rates on dried and evaporated fruits in portions of western trunk line territory; proposed increased carload rates on furniture from Kansas City and other points to Oklahoma, groups 6, 7 and 8; proposed charges for switching "run-by and setback" grain; proposed transit charges on fruits and vegetables in western trunk line and trans-Missouri territory and some of the proposed increases upon miscellaneous items. They have not justified a proposed readjustment of rates to Louisiana; proposed increases in carload rates on furniture from Kansas City and other points to Oklahoma, group point 9. Proposed increased less-than-carload rates to and from manufacturing points in Missouri on various commodities are found unlawful when made to vary with the quantity shipped.

COURT NEWS

The Supreme Court of Alabama by a vote of four to three has decided a case in the long-drawn-out litigation between the Louisville & Nashville and the Western Union Telegraph Company, against the telegraph company, holding that on certain divisions of the road, which figure in this case, there is no public necessity justifying the court in forcing the railroad to allow the telegraph company to continue the use of its right of way.

In the United States District Court at Buffalo, N. Y., December 17, the Northern Central Railway (Pennsylvania) was found guilty on 17 counts of paying illegal rebates on large quantities of coal shipped by the Mineral Railroad & Mining Company. In the same court, December 23, the Delaware, Lackawanna & Western Coal Company, indicted for illegal reduction in rates for transportation of coal by means of improper reduction of the rental charged the coal company by the railroad company, for the use of trestles at Buffalo, were acquitted by the jury.

Railway Officers

Executive, Financial, Legal and Accounting

Stewart C. Pratt has been appointed assistant general solicitor of the Lehigh Valley, with office at New York.

Woodward Hudson, counsel of the Boston & Albany, at Boston, Mass., has been appointed vice-president and general counsel of the Boston & Maine, with office at Boston, Mass. Effective January 1.

Walter D. Owens, chief clerk to the controller and secretary of the valuation committee of the Baltimore & Ohio, has been promoted to auditor of subsidiary lines of the Baltimore & Ohio, with headquarters at Baltimore, Md., succeeding J. L. Kirk, deceased.

G. N. Orcutt, assistant to president of the Erie at New York, has been elected a vice-president in charge of the purchasing, land and tax and federal valuation departments, with headquarters at New York. G. A. Richardson, vice-president at New York in charge of the financial and accounting departments, has resigned, effective January 1, 1916.

Operating

J. J. Prentice has been appointed assistant superintendent of the western division of the Chicago, St. Paul, Minenapolis & Omaha, with headquarters at St. James, Minn., vice Peter Copeland assigned to other duties. E. R. Gorman has been appointed trainmaster of the northern division, with headquarters at Spooner, Wis. Effective December 22.

John B. Dickson, general superintendent of the Erie at Cleveland, Ohio, has been appointed general manager of the lines west, with office at Cleveland. Franklin G. Robins, division superintendent at Buffalo, N. Y., has been appointed general superintendent of the lines west, with office at Youngstown, Ohio. Charles P. Eckels, division superintendent at Susquehanna, Pa., has been appointed superintendent of the Buffalo division at Buffalo, N. Y., and Joseph W. Foote, trainmaster at Susquehanna, Pa., has been appointed superintendent of the Delaware division, with office at Susquehanna, effective January 1, 1916.

The Chicago, Rock Island & Pacific has changed its operating organization and will have two instead of three districts, the second district being abolished. The new first and second districts will have their headquarters at Des Moines, Ia., and El Reno, Okla., respectively. The Nebraska and Colorado divisions are added to the first district, and the St. Louis, the Kansas City Terminal, the Kansas, and the El Paso divisions will be added to the new second district. A. E. Sweet, general manager of the second district, has resigned, to go to the Denver & Rio Grande, as reported last week. G. W. Rourke, assistant general manager of the second district, goes to El Reno to become assistant general manager of the new second district, succeeding A. B. Copley, deceased. C. W. Jones remains general manager of the first district as enlarged. T. H. Beacon, general manager of the old third, is general manager of the new second district. The other officers of the present first and second districts have their authority extended correspondingly. F. T. Beckett is engineer of maintenance of way of the new second district, and R. L. Stewart, mechanical superintendent.

Traffic

John T. Monroe has been appointed assistant general passenger agent of the Sunset-Central Lines, with office at Houston, Tex.

E. R. Whelen, general agent of the Cleveland, Cincinnati, Chicago & St. Louis at Cincinnati, Ohio, has been transferred to Chicago, Ill.

A. P. Johnson has been appointed division passenger agent of the St. Louis & San Francisco with office at Memphis, Tenn., effective January 1.

G. P. Ruickbie has been appointed district freight agent of the Canadian Pacific, Eastern division, at Ottawa, Ont., vice J. J. Kelly, acting district freight agent, transferred.

William L. Donaldson, assistant to general freight agent of the Lehigh Valley at New York, has been appointed assistant general freight agent, with headquarters at Buffalo, N. Y., succeeding Samuel A. Story, resigned to go into other business.

George A. Walton, general agent of the Canadian Pacific at Chicago, has been appointed general passenger agent with office at Winnipeg, Man., succeeding A. C. Shaw; T. J. Wall, general agent at Minneapolis, Minn., succeeds Mr. Walton as general agent at Chicago.

J. H. R. Parson, general passenger agent of Morgan's Louisiana & Texas Railroad & Steamship Company, with office at New Orleans, La., has been appointed general passenger agent of the Sunset-Central Lines of the Southern Pacific, with office at Houston, Tex.

C. E. Stone, general traffic manager of the Great Northern Pacific Steamship Company at San Francisco, Cal., has been appointed passenger traffic manager of the Great Northern. H. A. Noble, general passenger agent of the Great Northern, has been appointed general manager of the Glacier Park Hotel Company, effective January 1.

Engineering and Rolling Stock

Robert S. Parsons, general manager of the Erie, at Cleveland, Ohio, has been appointed chief engineer, with office at New York.

I. C. Newmarch, general foreman in the Collinwood, Ohio, locomotive shops, of the New York Central, has been appointed superintendent of shops, with headquarters at Collinwood locomotive shops, vice R. H. Montgomery, deceased.

O. S. Beyer, Jr., general foreman of the Horton, Kan., shops of the Chicago, Rock Island & Pacific, has been appointed first assistant in the engineering experiment station in the department of railway engineering of the University of Illinois.

H. C. May, superintendent of motive power of the Chicago, Indianapolis & Louisville, has been appointed to the same position on the Lehigh Valley, with office at South Bethlehem, Pa., succeeding F. N. Hibbits, resigned. Mr. May's first railroad service was with the Chesapeake & Ohio at Covington, Ky., where he served as machinist apprentice from 1892 to 1896. He was then machinist for three years at the same place. In 1899 he became a student in the Mechanical Engineering School of Purdue University at Lafayette, Ind., from which he graduated in 1902. He was then appointed master mechanic on the Cleveland, Cincinnati, Chicago & St. Louis at Louisville, Ky., remaining in that position until 1907. From 1907 to 1910 he served on the Louisville & Nashville as master mechanic at New Decatur, Ala., and at South Louisville, Ky., and since 1910 was superintendent of motive power of the Chicago, Indianapolis & Louisville.

OBITUARY

William C. Hayes, superintendent of locomotive operation of the Erie, at New York, died on December 25 at his home in New York.

Arthur A. Hurd, special counsel in Kansas of the Atchison, Topeka & Santa Fe, died at his home in Topeka on December 20, at the age of 66.

O. T. Maier, vice-president and general manager of the New Orleans, Southern & Grand Isle, committed suicide at New Orleans, La., on December 20.

George V. Sneden, engineer maintenance of way of the New York & Long Branch at Long Branch, N. J., died on December 24, at his home in Red Bank at the age of 60.

A. W. Swanitz, formerly chief engineer and manager of the Alaska Northern, with headquarters at Seward, Alaska, died at Alameda, Cal., on December 22. He participated in the construction of a number of railroads in various parts of the country.

Homer Eads, formerly division superintendent of the International & Great Northern at San Antonio, Tex., died in that city on December 19. He resigned his position with the railroad in September, 1911, and since that time has been engaged in private business enterprises.

Equipment and Supplies

LOCOMOTIVES

THE MINERAL RANGE is inquiring for 2 consolidation locomotives.

THE CAMBRIA STEEL COMPANY has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works.

THE LEHIGH & NEW ENGLAND has ordered 4 switching and 1 consolidation locomotives from the Baldwin Locomotive Works.

THE RICHMOND, FREDERICKSBURG & POTOMAC has ordered 4 Pacific type locomotives from the Baldwin Locomotive Works.

THE EAST TENNESSEE & WESTERN NORTH CAROLINA has ordered one ten-wheel locomotive from the Baldwin Locomotive Works.

THE NORFOLK SOUTHERN, reported in last week's issue as having ordered 4 consolidation locomotives from the Baldwin Locomotive Works, has increased this order to 6 locomotives.

THE INTER-URBAN RAILWAY has ordered one 60-ton electric locomotive from the McGuire-Cummings Manufacturing Company. The electrical equipment will be supplied by the Westinghouse Electric & Manufacturing Company.

FREIGHT CARS

THE SOUTH DAKOTA CENTRAL is asking prices on 2 refrigerator cars.

THE ANACONDA COPPER COMPANY has issued inquiries for 100 hopper cars.

THE BESSEMER & LAKE ERIE is reported as contemplating the purchase of 2,000 ore cars.

THE VIRGINIAN has given the Standard Steel Car Company an order to repair 250 box cars.

THE DIAMOND ALKALI COMPANY has ordered one tank car from the Pressed Steel Car Company.

THE UNITED STATES NAVY has ordered 2 tank cars from the German-American Car Company.

THE MINERAL RANGE has ordered 100 rock cars from the American Car & Foundry Company.

THE ILLINOIS CENTRAL has withdrawn its inquiry for 1,500 center sills mentioned in the issue of December 17.

EAST BROAD TOP.—The item in last week's issue to the effect that this company is in the market for 5 narrow gage hopper cars has been denied.

THE TUCSON, CORNELIA & GILA BEND has ordered 2 6,000-gal. tank cars from the German-American Car Company and 4 50-ton flat and 2 50-ton box cars from the McGuire Cummings Manufacturing Company.

THE UNION PACIFIC, reported in last week's issue as being in the market for box and stock cars, has issued inquiries for 1,500 box and 500 stock cars, but it is understood that the company intends to make total purchases of 4,000 cars.

DELAWARE & HUDSON.—It is reported, but not confirmed, that this company, which was reported in the *Railway Age Gazette* of December 3, as being in the market for 1,000 underframes, has ordered these underframes from the American Car & Foundry Company.

PASSENGER CARS

THE SOUTH DAKOTA CENTRAL is inquiring for 2 coaches.

THE BOSTON & MAINE has issued inquiries for 2 combination baggage and mail cars.

THE EAST BROAD TOP RAILROAD is contemplating the purchase of 4 or 5 second-hand narrow gage coaches.

THE NATIONAL RAILWAY OF MEXICO are reported to have ordered 30 sleeping and dining cars from the Pullman Company.

THE BOSTON & ALBANY will install steel underframes on 20 wooden coaches and 13 wooden baggage cars. See also New York Central.

THE CHESAPEAKE & OHIO, reported in the *Railway Age Gazette* of December 10 as being in the market for 12 express cars and 6 coaches, will also buy 2 chair cars.

THE MISSOURI, KANSAS & TEXAS has ordered 15 70-ft. steel baggage cars, 4 72½-ft. steel dining cars and 2 60-ft. steel postal cars from the American Car & Foundry Company.

THE CHICAGO, BURLINGTON & QUINCY has ordered 8 dining cars, 9 passenger and baggage cars, 15 coaches, 15 chair cars, 2 road and smoking cars and 5 postal cars from the American Car & Foundry Company. All these cars will be of all steel construction.

THE NEW YORK CENTRAL was reported in last week's issue as having placed orders for 105 coaches, as follows: Barney-Smith Car Company, 15 coaches for the Cleveland, Cincinnati, Chicago & St. Louis; Osgood Bradley Car Company, 25 for the Boston & Albany; American Car & Foundry Company, 45 for the New Central itself, and the Standard Steel Car Company, 20. This report is slightly incomplete in that only 30 of the cars ordered from the American Car & Foundry Company are for the New York Central proper; the remaining 15 are for the Michigan Central. The 20 cars ordered from the Standard Steel Car Company will also be built by the Osgood-Bradley Car Company, and are for the New York Central itself.

IRON AND STEEL

THE LEHIGH VALLEY has placed an order for 2,500 tons of 136-lb. rails.

THE CHICAGO & EASTERN ILLINOIS has ordered 10,0000 tons of rails from the Illinois Steel Company.

THE CHICAGO, BURLINGTON & QUINCY has ordered 5,000 tons of rails from the Lackawanna Steel Company.

THE INTERNATIONAL & GREAT NORTHERN has ordered 3,000 tons of rails from the Lackawanna Steel Company.

THE DULUTH, MISSABE & NORTHERN has ordered 459 tons of steel for the Lawrence Lake viaduct at Bovey, Minn., from the American Bridge Company.

MACHINERY AND TOOLS

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for a shear for cutting sheet bars or skelp, with a capacity of 12 in. in width and one inch thick. The shearing will be done cold. A 19-in. blade will be adequate.

THE NEW YORK CENTRAL has recently issued inquiries for a 42-in. car wheel boring machine, a double axle lathe, a 400-ton double end wheel press and a 6-in. forging machine for its shops at Air Line Junction, Ohio, and for a combination punch and shear for the shops at Englewood, Ill.

LIGHT RAILWAYS ON THE WESTERN FRONT.—From an article which recently appeared in one of the London papers it appears that the backbone of the German railway system in Champagne, the Bazancourt-Challerange line, is now within range of the French batteries, but this line has the advantage of being linked up with a comprehensive network of light railways. The German trains are run so near to the actual firing line "that their locomotives can at times be heard in the night." Tunnels have even been built in the danger zone for the handling of this traffic. Light railways of this nature are stated to have been laid throughout Belgium and the occupied districts of France with the object of relieving the pressure on the highways and of releasing cars for service in the Eastern theater of war, where the railway facilities are inferior. A uniform method of construction has been employed. The rails are light, but of high grade steel, laid on steel ties. They are built up in sections, which can thus be laid in a "ready-made" condition, so to speak. It is this feature which permits of track laying on level ground at the rate of some ten miles a day, which may be taken as equivalent to the average daily advance of an army. The lines are, of course, narrow gage, but the passenger cars can seat five people a side.

Supply Trade News

E. F. Carry, first vice-president and general manager of the American Car & Foundry Company has been elected president of the Haskell & Barker Car Company of Michigan City, succeeding Mr. W. T. McBride. Mr. Carry has been associated with the American Car & Foundry Company or its predecessors since 1888, and vice-president of the company since its formation in 1899.

The Economy Devices Corporation, New York, has opened a western office at room 1634, McCormick building, Chicago, under the management of Joseph Sinkler.

Warren Moore Osborn has been appointed representative for the Track Specialties Company, New York in the Chicago district with headquarters in the McCormick building in that city.

Graham Fraser, from 1904 until a short while ago director of the works of the Dominion Iron & Steel Company, and a director of the company, died recently at New Glasgow, N. S.

The Roberts & Schaefer Company, Chicago, have recently been awarded a contract for a 300-ton capacity, two-track automatic counterbalanced bucket locomotive coaling plant by the Chesapeake & Ohio for installation at Paintsville, Ky.

John C. Neale has been appointed general manager of sales of the Midvale Steel Company and the Worth Brothers Company. As such he will have complete charge of all sales matters. His office will be in the Widener Building, Philadelphia.

The Pilliod Company, New York, has received orders during the past 10 days for Baker valve gear to replace the Stephenson gear on 59 old engines. Included are orders from the Santa Fe; the Erie; Norfolk & Western; Pittsburgh & Lake Erie; New York, Ontario & Western, the Illinois Central, and the New York Central.

The American Mason Safety Tread Company, Lowell, Mass., announces that, effective January 1, 1916, Joseph T. Ryerson & Son, of Chicago, will act as general western distributors for its various types of Mason safety treads. A large stock of both lead and carborundum filled tread will be carried in stock for immediate deliveries.

Because of changes in the organization of Pierson, Roeding & Co., San Francisco, Cal., who have acted as the sales agents of the Electric Storage Battery Company of Philadelphia on the Pacific coast since 1910, the Battery Company will hereafter conduct its business on the coast through George R. Murphy, soliciting agent. Mr. Murphy will have offices in the Rialto building, 118 Montgomery street, San Francisco.

The Poland-Miller is a new company which has been organized with offices in the Erie building, Cleveland, Ohio, to conduct a general engineering business and to specialize in the design and inspection of coal, coke and ore handling machinery, docks and industrial plants. The company consists of J. F. Poland, formerly associated with the Brown Hoisting Machinery Company, and recently with the J. W. Frazier Company, in each case in the capacity of civil and structural engineer, and R. E. Miller, recently mechanical and electrical engineer of the J. W. Frazier Company.

William Claflin Andrews, advertising manager of the Edison Storage Battery Company, Orange, N. J., died in New York City, December 21. Mr. Andrews was a graduate of Columbia University. He was for a time sales engineer of the Stanley Instrument Company, Great Barrington, Mass., and later became connected with the General Electric Company in Schenectady, N. Y. and Harrison, N. J. He was for two years secretary of the Rae Company, New York, leaving to join the Edison Storage Battery Company in April, 1913, where he was advertising manager until his death.

The directorate of the Haskell & Barker Car Company, which company was recently organized, as noted in last week's issue, by a syndicate headed by Potter, Choate & Prentice and F. B. Keech & Co., will include Ambrose Monell, president of the International Nickel Company; William E. Corey, president of the Midvale Steel & Ordnance Corporation; Frank A. Vanderlip,

president of the National City Bank of New York; Edwin S. Webster, member of the firm of Stone & Webster; John Movrin, president of the Atlas Portland Cement Company; J. W. Harriman, president of the Harriman National Bank, and Arthur O. Choate, member of the firm of Potter, Choate & Prentice. The remaining members have not yet been chosen.

W. L. Conwell, vice-president and treasurer of the Transportation Utilities Company, New York, has been appointed assistant to the president of the Safety Car Heating & Lighting Company, effective January 1. Mr. Conwell has been in the service of the Transportation Utilities Company since 1911. He was born at Covington, Ky., January 25, 1887. He received his education in the public schools of Philadelphia and at the University of Pennsylvania, from which he graduated in 1898 with the degree of electrical engineer. He then passed the examinations for first assistant engineer for the United States Navy, but received no appointment because of the cessation of hostilities. He was employed in contracting work as a time-keeper for the Tennis Construction Company, Philadelphia, becoming later chief engineer and secretary of the company. In 1901 he resigned to become city salesman of the Westinghouse Electric & Manufacturing Company in New York. He was later placed in charge of the isolated plant department of the company, and for five years, ending in 1911, was engaged in railway work. In that year he became vice-president of the Transportation Utilities Company.

W.L.Conwell

Paul M. Lincoln, for over 23 years connected with the operating and engineering activities of the Westinghouse companies, will on January 1 become associated with the sales department of the Westinghouse Electric & Manufacturing Company, with the title of commercial engineer. Mr. Lincoln, shortly after his graduation from Ohio State University in 1892, entered the employ of the Short Electric Company in Cleveland. He then went to the Westinghouse Electric & Manufacturing Company, and was engaged in the testing-room, and in general engineering work. When the plant of the Niagara Falls Power Company was opened he became its electrical superintendent, and as such had much to do with the first transmission line to Buffalo. In 1902 he returned to the Westinghouse Company, specializing on the general engineering of power stations and transmission lines. He was for several years in charge of the power engineering department, but was transferred to the engineering department when that was organized. Mr. Lincoln is well known in engineering circles through his active work in the American Institute of Electrical Engineers, of which at one time he was president. He is a well-known writer on technical subjects and has also been identified with educational work for some time, filling the chair of professor of electrical engineering at the University of Pittsburgh.

P. M. Lincoln

Kelly, Cooke & Co. have recently opened offices in the Drexel building, Philadelphia, to conduct a general engineering practice in the public utility and industrial fields. Their organization is equipped for the design and supervision of construction for railways, light and power properties and industrial plants, engineering reports, appraisals and rate developments for public utilities. The firm also investigates industrial situations to develop ways and means for reducing manufacturing costs. William F. Kelly, senior member, received the degree of Mechanical Engineer from the University of Pennsylvania in 1893. For several years thereafter he was on the engineering staff of the Union Traction Company of Philadelphia and from 1901 to 1915 was a member of the staff of Ford, Bacon & Davis, acting as engineer in charge of several of their larger operations, including the construction and reconstruction of the Knoxville Railway & Light Company and the Birmingham Railway, Light & Power Company. Charles B. Cooke, Jr., was also graduated from the University of Pennsylvania and entered the shops of the Westinghouse Machine Company, East Pittsburgh, working up finally to the position of assistant commercial engineer of the company, which position he occupied for two years prior to joining the staff of Ford, Bacon & Davis. During his connection with the latter firm Mr. Cooke specialized on financial engineering reports and also had personal charge of a number of important rate developments and reports for public utility companies.

TRADE PUBLICATIONS

ELECTRICAL APPARATUS.—One of the recent publications of the railway and lighting department of the Westinghouse Electric & Manufacturing Company is an illustrated booklet containing a paper presented before the Railway Club of Pittsburgh by E. M. Herr, entitled "Notes on Electric Power Development."

BOILERS.—One of the recent booklets issued by the Harrison Safety Boiler Works, Philadelphia, Pa., is a reprint of an article by George H. Gibson on the subject, "Establishing and Maintaining Boiler Room Economy." The paper is taken from a recent issue of the Journal of the Ohio Society of Mechanical, Electrical and Steam Engineers.

ELECTRICAL APPARATUS.—The Esterline Company, Indianapolis, Ind., in its recently issued bulletin No. 365 describes the new line of Esterline graphic meters. These instruments are intended for checking up voltage and current on alternating current circuits and have been designed for use where the usual high price of graphic meters may possibly be prohibitive.

LOCOMOTIVES.—Bulletin No. 1, recently issued by the Lima Locomotive Corporation, contains illustrations and general descriptions of a number of locomotives which the company has built for representative railroads. Included are the Erie Pacific, Mikado and six-wheel switching locomotives, a Duluth & Iron Range Mikado locomotive, a Pennsylvania Lines West six-wheel switching locomotive, a Lackawanna eight-wheel switching locomotive, etc.

CORK INSULATION.—The Armstrong Cork & Insulation Company, Pittsburgh, Pa., has issued a 152-page book describing its Nonpareil corkboard insulation. This book, which is prepared in an attractive manner, describes briefly the preparation of cork and more in detail the merits of this material for different purposes and tests to which it has been subjected. Nearly one-half the book is devoted to specifications covering the methods of erecting Nonpareil corkboard for a wide variety of conditions. The book is well illustrated with photographs of typical installations of this material.

WELDING.—The Goldschmidt Thermit Company, 90 West street, New York, has recently issued three attractive bulletins relative to the Thermit process of welding. One is a folder, treating in a somewhat general way of the subject of locomotive repairs. The other two are much more elaborate and are entitled, respectively "Thermit Locomotive Repairs" and "Thermit Mill and Foundry Practice." These books contain instructions for the use of Thermit and are illustrated with drawings and other views showing the necessary steps to be taken. There are also a number of views showing the results which may be obtained.

Railway Construction

Alabama Roads.—Bids were received recently, it is said, by the Bell Lumber Company for grading about three miles of a seven-mile lumber line. The Alabama Engineering Corporation, C. M. Ayres, president, Tuscaloosa, Ala., will locate and supervise the construction of the line.

Graham County Railroad.—According to press reports, a contract has been given to the Wright-Johnston Construction Company, Andrews, N. C., to grade 12 miles between Topton, N. C., and Robbinsville. The headquarters of the company are at Andrews. The Graham County Lumber Company is said to be interested in the project. (October 29, p. 828.)

Guthrie-Edmond (Electric).—Incorporated in Oklahoma with $500,000 capital, it is said, to build an extension of the Oklahoma Railway from Edmond, Okla., north to Guthrie, 15.5 miles. The incorporators include B. Shartel, G. B. Treat and E. J. Reichart, Oklahoma City.

Lutcher & Moore Lumber Company.—This company will extend its present logging railroad from its northern terminus in Louisiana 35 miles northeast to the vicinity of Stables, La. The road is now about 35 miles long and extends from Sabine river at Nibett's Bluff into the adjacent lumber country. The extension will cross the Gulf, Colorado & Santa Fe near Merryville, La. At present the southern terminus of the road, Nibett's Bluff, is 18 miles from the company's mills at Orange, Tex., and it is planned eventually to lay track over this distance also. The work has not yet passed the survey stage.

New Brunswick Roads.—Application has been made to the Legislature for a guarantee of $20,000 a mile to build a railway from a point on the Canadian Pacific to connect with Beaver Harbor, N. B., Black's Harbor, LeTang and Eastport, Maine. L. Connors, president of Connors Brothers, Limited, Black's Harbor, N. B., is back of the project.

New York Subways.—The New York Public Service Commission, First district, will advertise for bids, to be opened January 14, for the construction of Section No. 2-A of Route No. 12, a part of the Broadway-Fourth Avenue Rapid Transit Railroad. Section 2-A extends from Prospect Park plaza at Flatbush avenue to a point at the intersection of Flatbush avenue, Ocean avenue and Malbone street in the borough of Brooklyn. It will be a two-track line and will connect with the Brighton Beach railroad at Malbone street. The commission also authorized the New York Municipal Railway Corporation to award the contract for the reconstruction of the Brighton Beach line, to connect with this section of the subway, to the Inter-Continental Construction Company, the lowest bidder. The work will cost over $1,000,000, and is to be completed within 24 months.

Norfolk & Western.—This company plans to carry out during 1916 second track work between Walton, Va., and Ripplemead, on 8.65 miles.

Oklahoma Railway.—See Guthrie-Edmond.

Salem & Pennsgrove Traction.—The Board of Public Utility Commissioners of New Jersey has approved the general plan of this company for the construction of an electric line from Salem, N. J., north via Pennsville to Pennsgrove, about 12 miles. It is understood that construction work will be started at once from the Pennsgrove end. A. B. Smith, secretary and treasurer of the Smith Davis Lumber Company, Salem, N. J., is interested. (September 3, p. 449.)

Savannah & Northwestern.—The Savannah & Atlantic has been incorporated with $500,000 capital, it is said, to build the extension of the Savannah & Northwestern from St. Clair northwest about 35 miles. (October 8, p. 670.)

South Boston Industrial Track.—Under this name work is now being carried out on a 2-mile railway from a point on the New York, New Haven & Hartford South Boston to the waterfront. Track has already been laid on one mile. The New York, New Haven & Hartford and F. T. Ley & Co., Inc., are carrying out the work.

Stateville Air Line.—Grading work is now under way from Stateville, N. C., to Mt. Airy, 62 miles. The work is being carried out from Stateville north, and has already been completed on a section of about 20 miles. D. M. Ausley, treasurer and general manager, Stateville, N. C. (July 2, p. 39.)

Texas Roads (Electric).—The Pecos Valley Railroad Association, Buenavista, Tex., plans to build a gas-electric interurban line from a point on the Kansas City, Mexico & Orient in Texas, northwest up the Pecos Valley in Pecos county for 25 or 35 miles. Such a line would supply railway facilities for the Imperial, Zimmerman and Grand Falls irrigation systems. The line will probably be extended later up the valley to connect with other railroads. V. L. Sullivan, chairman, Buenavista, Tex. (See Texas Roads, Oct. 29, p. 829.)

Toronto, Hamilton & Buffalo.—Surveys are now being made to build an extension of the Dunnville branch from Dunnville, Ont., to Port Maitland, 3.12 miles.

Vandalia.—This railroad has begun the construction of additional tracks at Rose Lake Yard, Ill., which will increase the capacity of the yards for handling cars about 50 per cent, and will cost about $80,000. The new tracks will measure 33,710 ft., and will be apportioned as follows: A westward running track between Rose Lake Yard and Willows, three repair yard tracks, extension of one repair yard track, four westward storage tracks, a caboose track, a wreck train track, five tracks in the eastward yard, a stock car cleaning track, necessary crossovers and ladder tracks. The work is being done by a force of 100 men, and will be completed early in January. F. T. Hatch, chief engineer.

Yellville-Rush & Mineral Belt.—Incorporated in Arkansas with $140,000 capital, it is said, to build a 19-mile line through Yell county, Ark. It is understood that work will be started early in 1916 on the line. J. C. Shepard, president, Rush, Ark.

RAILWAY STRUCTURES

Butte, Mont.—The Chicago, Milwaukee & St. Paul is preparing plans for a new passenger station. The depot will be used also by the Butte, Anaconda & Pacific.

Houston, Tex.—This city will soon begin the construction of railway yards near the turning basin of the Galveston-Houston ship canal on the south side of the bayou. As soon as the yards are completed a switch-engine will be purchased, and all cars over the municipal wharves, most of which are already constructed, will be handled by the city.

Jersey City, N. J.—The Lehigh Valley is building, at its Jersey City terminal, a new open pile pier, 580 ft. long by 67 ft. wide. This pier is to have five tracks. Freight can be loaded direct from the cars to lighters or small vessels. In addition, two other piers are being remodelled at the same location. The total cost of these improvements will be about $100,000.

Louisville, Ky.—The Pennsylvania Lines West contemplate reconstructing the bridge crossing the Ohio river here. The present structure is a mile in length and carries a single track; it consists of a draw span over the canal, a 370-ft. through span called the Kentucky Chute, a 400-ft. through span for the Indiana Chute, and a succession of deck Fink trusses with spans ranging from 149½ ft. to 245½ ft. The entire structure eventually will be rebuilt to carry two tracks, according to the plans of the company, but the work has been divided into five parts and the five spans at the Indiana end of the bridge, comprising a length of about 790 ft., will be reconstructed first.

Penrose, Colo.—The Beaver, Penrose & Northern has completed a combination engine-house and pumping station. The building is of cement and timber construction, 60 ft. by 170 ft. Cost, $4,000. G. E. Whitlock, engineer.

Perth Amboy, N. J.—The Lehigh Valley is rebuilding its old clay pier at Perth Amboy. When completed, this pier will be 825 ft. long by 69 ft. wide, and will cost $105,000.

San Antonio, Tex.—Work on new yards and shops to be constructed for the International & Great Northern on an 80-acre tract purchased recently, will begin on January 1. Rails and material are expected to arrive this week. The plans call for an expenditure of $250,000.

Railway Age Gazette

SECOND HALF OF 1915—NO. 27 SIXTIETH YEAR

NEW YORK: Woolworth Bldg.
CHICAGO: Transportation Bldg.

NEW YORK—DECEMBER 31, 1915—CHICAGO

CLEVELAND: Citizens Building
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Classified Directory of Advertisers, Page 6

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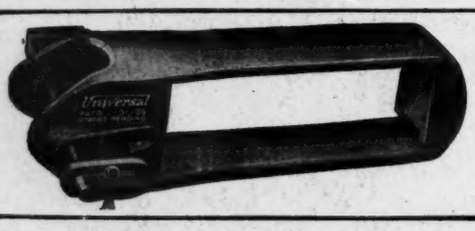

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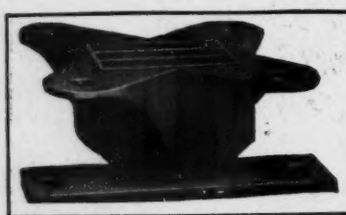

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The Indestructible rail joint insulation. A perfect non-conductor under all climatic conditions. Write for full particulars.

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The superb service of "The Olympian" cannot but satisfy the most exacting travel demands

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Quite in keeping with this palatial train, making the zenith of travel pleasure, is the matchless scenery of three mountain ranges—The Rockies, Bitter Roots and Cascades.

Two trains for Seattle and Tacoma leave Chicago daily—"The Olympian" at 10.15 P.M.—"The Columbian" at 8.30 A. M. via the

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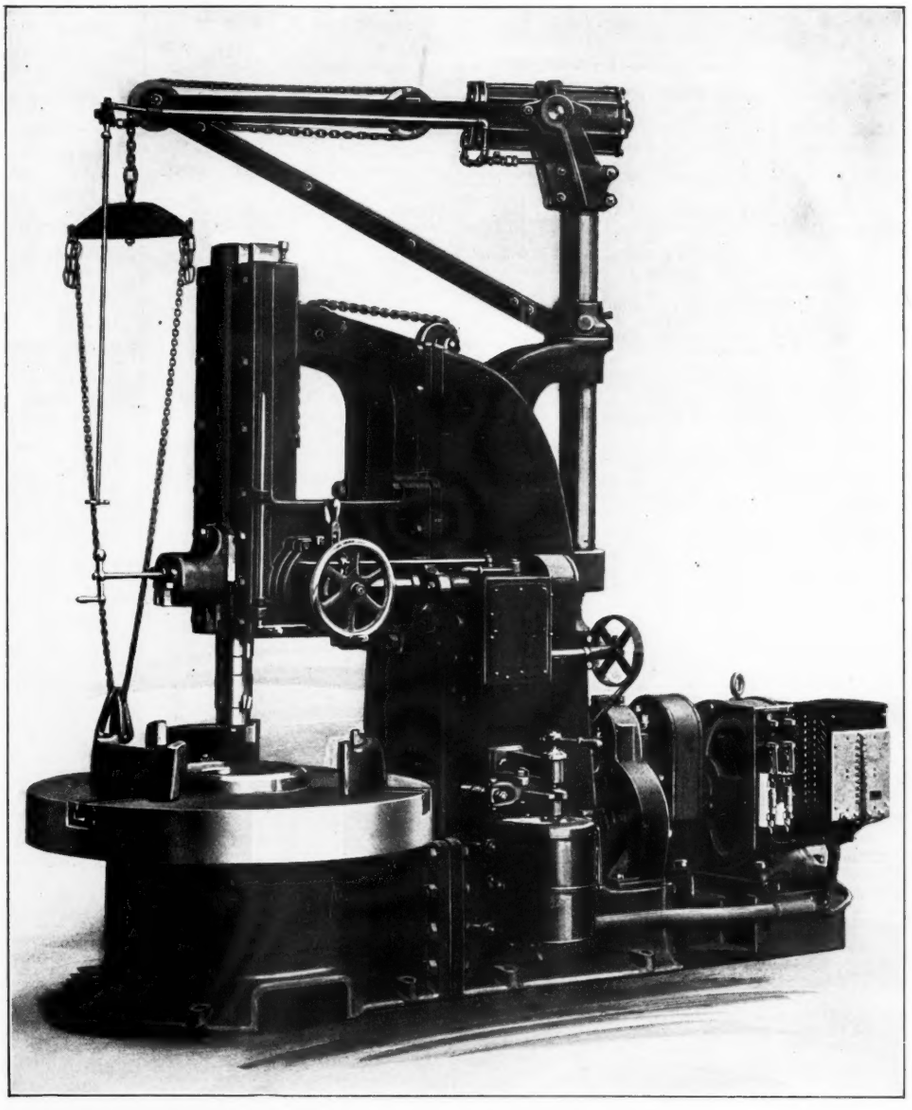

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Safety Car Heating & Lighting Co.

LIGHTING FIXTURES (STATIONS, TERMINALS, OFFICES, WAREHOUSE, YARDS, ETC).
Luminous Unit Co.

LINE CONNECTIONS.
Fargo Mfg. Co.

LIQUID FUEL FURNACES—(SEE FURNACES, LIQUID FUEL).

LOCK NUTS.
Columbia Nut & Bolt Co., Inc.
Franklin Ry. Supply Co.

LOCKS, DOOR (FREIGHT CAR).
Camel Company.

LOCKS, SASH.
Edwards Co., Inc., O. M.

LOCKS, SWITCH.
Edwards Co., Inc., O. M.

LOCK WASHERS — (SEE WASHERS, LOCK).

LOCOMOTIVE DEALERS.
Central Locomotive & Car Works.
Fitz-Hugh, Luther Co.
Zelnicker Supply Co., Walter A.

LOCOMOTIVE HEADLIGHTS — (SEE HEADLIGHTS).

LOCOMOTIVE SMOKE JACKS—(SEE SMOKE JACKS).

LOCOMOTIVE TIRES — (SEE TIRES, STEEL).

LOCOMOTIVE TRACK SANDERS —(SEE SANDERS).

LOCOMOTIVES, COMPRESSED AIR.
Baldwin Locomotive Works, The.

LOCOMOTIVE CONTRACTORS.
American Locomotive Co.
Baldwin Locomotive Works, The.
Central Locomotive & Car Works.
Lima Locomotive Corporation.

LOCOMOTIVES, ELECTRIC.
American Locomotive Co.
Baldwin Locomotive Works, The.
General Electric Co.
Westinghouse Electric & Mfg. Co.

LOCOMOTIVES, GASOLINE.
Baldwin Locomotive Works, The.

LOCOMOTIVES, GEARED.
Baldwin Locomotive Works, The.
Lima Locomotive Corporation.

LOCOMOTIVES, MINE.
American Locomotive Co.
Baldwin Locomotive Works, The
Central Locomotive & Car Works.
General Electric Co.
Westinghouse Electric & Mfg. Co.

LOCOMOTIVES, REBUILT.
American Locomotive Co.
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Fitz-Hugh, Luther Co.

LOCOMOTIVES, SECOND-HAND.
Central Locomotive & Car Works.
Fitz-Hugh, Luther Co.
Southern Iron & Equipment Co.
Zelnicker Supply Co., Walter A.

LOCOMOTIVES, STEAM.
American Locomotive Co.
Baldwin Locomotive Works, The.
Central Locomotive & Car Works.
Lima Locomotive Corporation.

LOOSE-LEAF LEDGERS — (SEE LEDGERS, LOOSE-LEAF).

LUBRICANTS, GRAPHITE—(SEE GRAPHITE, LUBRICANT).

LUBRICANTS, OIL AND GREASE.
Galena-Signal Oil Co.

LUBRICATORS.
Detroit Lubricator Co.
Edna Brass Mfg. Co., The.
Flint & Chester, Inc.
Franklin Railway Supply Co.
Nathan Mfg. Co.

LUBRICATORS, AUTO, DRIVING BOX.
Franklin Ry. Supply Co.

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Baxter & Co., G. S.
Bowie Lumber Co.
Duncan Lumber Co.
Frost-Johnson Lumber Co.
Stone, Frank B.
Wyckoff Pipe & Creosoting Co., Inc.

MACHINE TOOLS — (SEE ALSO PORTABLE TOOLS).
Manning, Maxwell & Moore, Inc.
Sellers & Co., Inc., Wm.
Watson-Stillman Co.
Wood & Co., R. D.

MACHINISTS' TOOLS — (SEE TOOLS, MACHINISTS').

MAGNETS, LIFT.
Browning Co., The.
Industrial Works.

MAIL CRANES — (SEE CRANES, MAIL).

MALLEABLE IRON CASTINGS—(SEE CASTINGS, MALLEABLE IRON).

MANGANESE CROSSINGS AND FROGS — (SEE MANGANESE, STEEL TRACK WORK).

MANGANESE STEEL TRACK WORK.
Indianapolis Switch & Frog Co.

MEASURING TAPES — (SEE TAPES).

MECHANICAL DRAFT APPARATUS.
B. F. Sturtevant Co.

MECHANICAL TESTING.
Electrical Testing Laboratories.

METAL LATH.
American Rolling Mill Co.

METALLIC PACKING — (SEE PACKING.

METALLIC PAINTS—(SEE PAINTS, METALLIC).

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METAL SASH MOULDINGS AND OFFICE FURNITURE.
Edwards Co., Inc., O. M.

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MINING MACHINERY.
General Electric Co.
Krupp (Prosser & Son).
Lima Locomotive Corporation.
Westinghouse Electric & Mfg. Co.

MIXERS, CONCRETE.
Link Belt Co.
McMyler Interstate Co.

MOTOR CARS, PASSENGER — (SEE CARS, GASOLINE AND CARS, GASOLINE-ELECTRIC).

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B. F. Sturtevant Co.
Western Electric Co.
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National Tube Co.

NUT LOCKS.
Am. Nut & Bolt Fastener Co.
Columbia Nut & Bolt Co., Inc.
U. S. Metal & Mfg. Co.

NUT MACHINES — (SEE BOLT AND NUT MACHINERY).

NUTS—(SEE BOLTS AND NUTS).

OIL CUPS.
Detroit Lubricator Co.
Edna Brass Mfg. Co., The.
Nathan Mfg. Co.
U. S. Metallic Packing Co.

OIL ENGINES — (SEE ENGINES, CRUDE AND FUEL OIL).

OIL FURNACES — (SEE FURNACES, LIQUID FUEL).

OIL, LIQUID CRESOTE.
Barrett Mfg. Co.

OIL, LUBRICATING — (SEE LUBRICANTS, OIL AND GREASE).

OILS.
Galena-Signal Oil Co.

OILS, LINSEED AND PAINT.
Kay & Ess Co.

OIL STORAGE TANKS — (SEE TANKS, OIL STORAGE).

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American Balance Valve Co.
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Union Fibre Co.
U. S. Metallic Packing Co.

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Pittsburgh Iron & Steel Foundries.

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Dixon Crucible Co., Jos.
Johns-Manville Co., H. W.
Kay & Ess Co.
Lehon Company.
Sherwin-Williams Co.
Standard Asphalt & Rubber Co.
U. S. Metal & Mfg. Co.
Wadsworth-Howland Co.

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Johns-Manville Co., H. W.
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Lehon Company.
Sherwin-Williams Co., The
Standard Asphalt & Rubber Co.

PAINTS, LOCOMOTIVE.
Kay & Ess Co.
Sherwin-William Co.

PAINTS, METALLIC.
Dixon Crucible Co., Joseph.
Kay & Ess Co.
Sherwin-Williams Co.
Wadsworth-Howland Co.

PAINTS, PRESERVATIVE.
Barrett Mfg. Co.
Sherwin-Williams Co., The

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Norris, James L.

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Barrett Mfg. Co.

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Electrical Testing Laboratories.

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Industrial Works.
McMyler Interstate Co.

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Carnegie Steel Co.

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Tyler Tube & Pipe Co.
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Canton Culvert & Silo Co.
Coast Culvert & Flume Co.
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Corrugated Culvert Co.
Delaware Metal Culvert Co.
Dixie Culvert & Metal Co.
Hardesty Mfg. Co., R.
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Independence Corrugated Culvert Co.
Iowa Pure Iron Culvert Co.
The Kentucky Culvert Mfg. Co.
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Lone Star Culvert Co.
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New England Metal Culvert Co.
North-East Metal Culvert Co.
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Pennsylvania Metal Culvert Co.
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Spokane Corrugated Culvert Co.
Tennessee Metal Culvert Co.
U. S. Cast Iron Pipe Co.
Utah Corrugated Culvert & Flume Co.
Virginia Metal Culvert Co.
Western Metal Mfg. Co.
Wyatt Metal Works.

PIPE COVERING—(SEE COVERING, PIPE AND BOILER).

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PIPE FITTINGS — (SEE FITTINGS, PIPE).

PIPE, WOOD.
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Krupp (Prosser & Son).

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American Rolling Mill Co.

PLATES, TIN AND TERNE.
American Sheet & Tin Plate Co.

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Gould Coupler Co.
McConway & Torley Co.
Standard Coupler Co.

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Franklin Ry. Supply Co.

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Massachusetts Mohair Plush Co.

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Independent Pneumatic Tool Co.
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Open Hearth Steel Rails

Have stood a test of service that positively proves a superior quality of steel—a test such as the product of no other steel plant on the American continent, if in the world, has had. 1,250,000 tons of Algoma rails have been laid where the climatic and service conditions were as severe as could be conceived—on new track, in sections of the country where there are extreme variations of temperature, from 90° in summer to 55° below zero in winter, and where there is tremendous heaving due to frost. The extremely small number of failures that resulted, under these severe conditions, leaves no question as to the *quality* of Algoma rails.

ALGOMA STEEL CORPORATION, LTD.

Sault Ste. Marie **Canada**

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POP SAFETY VALVES — (SEE VALVES, SAFETY, POP).

PORTABLE TRACK — (SEE TRACK, PORTABLE).

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POWER HAMMERS—(SEE HAMMERS, POWER).

POWER TRANSMISSION — (SEE TRANSMISSION, POWER).

PRESERVATIVES, RUBBER.
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PRESSED STEEL SHAPES—(SEE SHAPES, PRESSED STEEL).

PRESSES, POWER.
Chambersburg Engineering Co.

PROTECTORS, BOND WIRE.
P. & M. Co., The.

PUMPING ENGINES—(SEE ENGINES, HOISTING AND PUMPING).

PUMPS AND PUMPING MACHINERY.
Chambersburg Engineering Co.
Ingersoll-Rand Co.
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Moore & Sons, Corp., Samuel L.
Wood & Co., R. D.

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Sellers & Co., Inc., Wm.
Watson-Stillman Co.
Wood & Co., R. D.

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Q & C Co.
Watson-Stillman Co.

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General Electric Co.
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Indianapolis Switch & Frog Co.
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Q & C Co.
Railroad Supply Co.
Ramapo Iron Works.
Weir Frog Co.

RAIL CLAMPS, GUARD.
P. & M. Co., The.
Q & C Co.

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National Malleable Castings Co.
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Q & C Co.

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Griffith Lawrence.
Indianapolis Switch & Frog Co.
McConway & Torley Co.
Q & C Co.
Rail Joint Co.
Railroad Supply Co.

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Q. & C. Co.

RAIL JOINTS, STEP OR COMPROMISED.
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Industrial Works.
Q & C Co.

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Flint & Chester, Inc.
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Railroad Supply Co.
U. S. Metal & Mfg. Co.
Weir Frog Co.

RAILWAYS.
Chicago, Milwaukee & St. Paul Ry.
Chicago & North Western Ry.
Missouri Pacific Railway System.

RAILS (DEALERS).
Central Locomotive & Car Works.
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Pollak Steel Co.
Southern Iron & Equipment Co.
Zeinicker Supply Co., Walter A.

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Cambria Steel Co.
Carnegie Steel Co.

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Cleveland Twist Drill Co.

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U. S. Metal & Mfg. C.

REFRIGERATORS.
White Enamel Refrigerator Co.

REPLACERS, CAR.
Kalamazoo Railway Supply Co.
Q. & C. Co.
U. S. Metal & Mfg. Co.

RETAINERS, GUARD RAIL.
P. & M. Co., The.

RIVETING MACHINES—(SEE ALSO PNEUMATIC TOOLS; PORTABLE TOOLS).
Chambersburg Engineering Co.
Chicago Pneumatic Tool Co.
Independent Pneumatic Tool Co.
Ingersoll-Rand Co.
Sellers & Co., Inc., Wm.

ROAD PRESERVATIVES.
Barrett Mfg. Co.

ROCK DRILLS—(SEE DRILLS, ROCK).

ROLLING DOORS AND SHUTTERS—(SEE DOORS, FOLDING; DOORS, ROLLING).

ROOFING, CAR.
American Sheet & Tin Plate Co.
Chicago-Cleveland Car Roofing Co.
Johns-Manville Co., H. W.
Lehon Company.

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American Sheet & Tin Plate Co.
Johns-Manville Co., H. W.
Stark Rolling Mill Co.

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American Sheet & Tin Plate Co.
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Federal Cement Tire Co.
General Roofing Mfg. Co.
Johns-Manville Co., H. W.
Lehon Company.
Standard Asphalt & Rubber Co.
Stark Rolling Mill Co.

ROOFING, TILE.
Federal Cement Tile Co.

ROPE TRANSMISSION — (SEE TRANSMISSION, POWER).

RUBBER PRESERVATIVES — (SEE PRESERVATIVES, RUBBER).

SAND BLAST EQUIPMENT.
Cement-Gun Co.

SANDERS, LOCOMOTIVE TRACK.
U. S. Metallic Packing Co.
Western Railway Equipment Co.

SASH BALANCES.
Edwards Co., Inc., O. M.

SASH LOCKS — (SEE LOCKS, SASH).

SASH OPERATING DEVICE (FOR BUILDINGS).
Drouve Co., G., The.

SAWS, RAIL—(SEE RAIL SAWS).

SCALES
Fairbanks, Morse & Co.

SCHOOLS.
Sheffield Scientific School.

SCRAP METAL.
Hyman Michaels Co.
U. S. Metal & Mfg. Co.

SECOND-HAND EQUIPMENT — (SEE ADVERTISEMENTS BEGINNING FOURTH PAGE FOLLOWING READING).

SELECTORS, TELEPHONE.
Western Electric Co.

SEWER PIPE—(SEE PIPE, CULVERT).

SHADE ROLLERS.
Edwards Co., Inc., O. M.

SHAFTING.
Krupp (Prosser & Son).
Link Belt Co.
Sellers & Co., Inc., Wm.

SHAFTING, HOLLOW.
Falls Hollow Staybolt Co.
Tyler Tube & Pipe Co.

SHAPES, PRESSED STEEL.
Greenville Steel Car Co.
Krupp (Prosser & Son).
Pressed Steel Car Co.

SHAPING MACHINES.
Sellers & Co., Inc., Wm.

SHEARING MACHINES—(SEE PUNCHING AND SHEARING MACHINES).

SHEATHING PAPER.
Barrett Mfg. Co.
Chicago-Cleveland Car Roofing Co.
Johns-Manville Co., H. W.
Lehon Company.
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Union Fibre Co.

SHEETS, BLACK AND GALVANIZED.
American Rolling Mill Co.
American Sheet & Tin Plate Co.
Berger Mfg. Co., The.
National Corrugated Culvert Mfg. Co. (Publicity Bureau, Armco Culverts).
Stark Rolling Mill Co.

SHEETS, CORRUGATED.
American Sheet & Tin Plate Co.
Stark Rolling Mill Co.

SHEETS, ELECTRICAL.
American Sheet & Tin Plate Co.

SHEETS, LOCOMOTIVE JACKET.
American Sheet & Tin Plate Co.

SHEETS, PLANISHED IRON.
American Sheet & Tin Plate Co.

SHEETS, POLISHED STEEL.
American Sheet & Tin Plate Co.

SHEETS, SPECIAL.
American Sheet & Tin Plate Co.

SHELVING, STEEL.
Berger Mfg. Co.

SHINGLES.
Johns-Manville Co., H. W.

SHOVELS, SPADES AND SCOOPS
Kalamazoo Ry. Supply Co.

SHOVELS, STEAM—(SEE STEAM SHOVELS).

SHUTTERS, ROLLING — (SEE DOORS, FOLDING; DOORS, ROLLING).

SIDE BEARINGS — (SEE BEARINGS, SIDE).

SIDING, METAL.
American Sheet & Tin Plate Co.
Stark Rolling Mill Co.

SIGNAL CORD—(SEE CORD, SIGNAL).

SIGNAL LAMPS — (SEE LAMPS AND LANTERNS)

SIGNAL LIGHTING ACETYLENE
Commercial Acetylene Ry. Light & Signal Co.

SIGNAL PIPE.
National Tube Co.

SIGNAL WIRE—(SEE WIRE, INSULATED).

SIGNALS.
Federal Signal Co.
Railroad Supply Co.
Union Switch & Signal Co.

SIGNALS, CAB.
Buell Signal & Train Control Co.
Julien-Beggs Signal Co.

SIGNALS, CROSSING.
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Railroad Supply Co.
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SILLS, CAR.
Union Steel Castings Co.

SKID SHOES.
Q. & C. Co.

SKYLIGHTS.
Drouve Co., G., The.

SLIDE RULES.
Kolesch & Co.

SLIDE VALVES—(SEE VALVES).

SLOTTING MACHINES.
Sellers & Co., Inc., Wm.

SMOKE JACKS.
Dickinson, Inc., Paul.
Johns-Manville Co., H. W.

SNOW PLOWS.
American Locomotive Co.

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Virginia Bridge & Iron Co.

STANDPIPES — (SEE WATER COLUMNS).

STAYBOLT IRON — (SEE IRON, STAYBOLT).

STAYBOLTS.
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Flannery Bolt Co.

STAYBOLTS SLEEVES.
American Balance Valve Co.

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STEAM GAGES — (SEE GAGES, STEAM).

STEAM HAMMERS—(SEE HAMMERS, POWER).

STEAM SHOVELS.
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STEEL CASTINGS—(SEE CASTINGS, IRON AND STEEL).

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Cambria Steel Co.

STEEL SHELVING—(SEE SHELVING, STEEL).

STEEL LOCOMOTIVE FIREBOX.
Lukens Iron & Steel Co.

STEEL, STRUCTURAL.
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STEEL, TOOL.
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STEEL, VANADIUM.
American Vanadium Co.
United Steel Co.

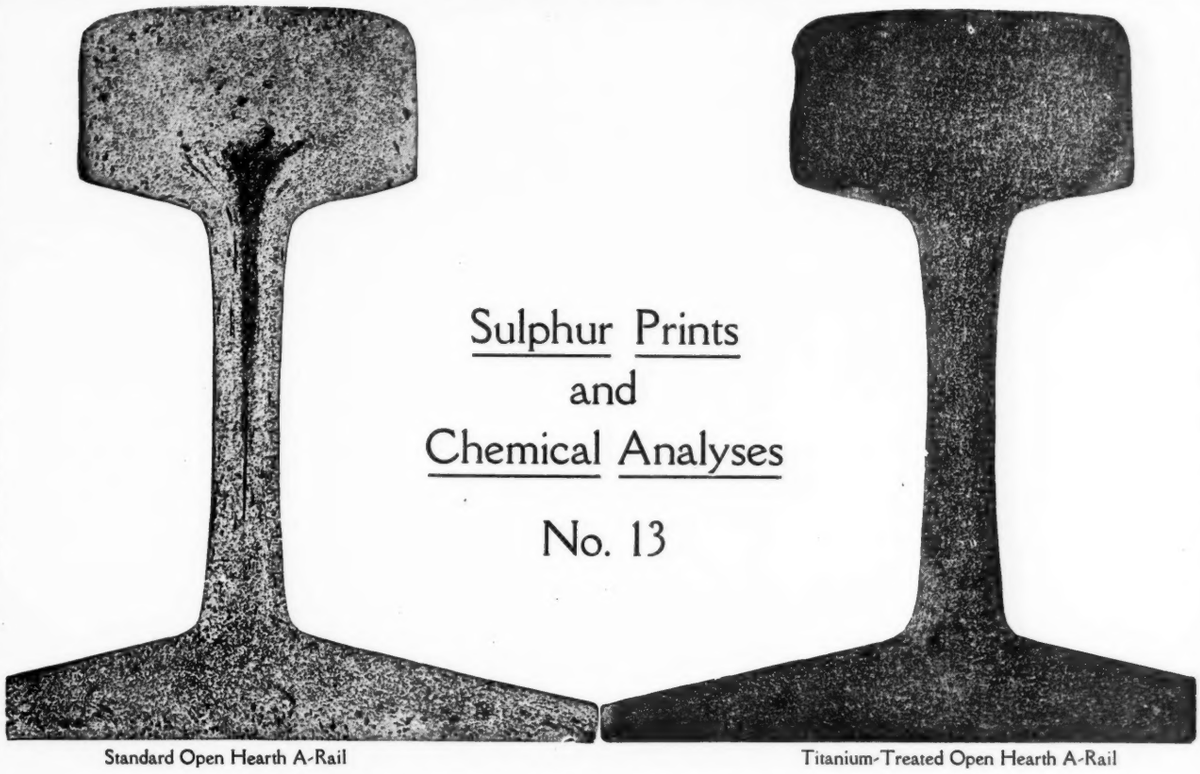
STOKERS, LOCOMOTIVE.
Locomotive Stoker Co.

STORAGE BATTERIES — (SEE BATTERIES, ELECTRIC).

STRUCTURAL STEEL—(SEE STEEL, STRUCTURAL).

SUPERHEATERS.
Power Specialty Co.

SURVEYING INSTRUMENTS — (SEE ENGINEERING INSTRUMENTS).



Standard Open Hearth A-Rail

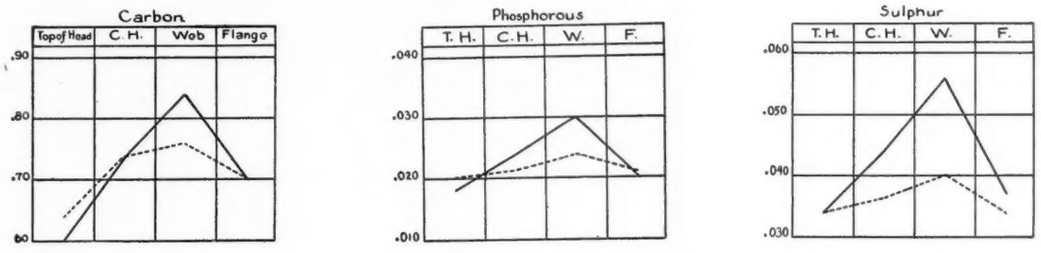
Titanium-Treated Open Hearth A-Rail

Sulphur Prints and Chemical Analyses

No. 13

TITANIUM-TREATED OPEN HEARTH RAIL STEEL

It is a well known fact that Carbon, Phosphorus and Sulphur segregate along similar lines. Diagrams below—showing average segregation of Carbon, Phosphorus and Sulphur in 17 Samples of Standard and 17 of Titanium Treated Open Hearth A-Rails reported upon in Bulletins 1 to 7 inclusive prove this fact and show graphically the greatly reduced segregation of these elements in the Titanium-Treated Rails.



Standard _____

Titanium Treated _____

In studying Sulphur Prints it should be remembered that excessive segregation of sulphur there illustrated indicates similar segregation of Carbon and Phosphorus—those two dangerous embrittling elements.

Titanium Alloy Manufacturing Company

Operating Under Rossi Patents

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SUSPENSION CABLEWAYS — (SEE CABLEWAYS).

SWITCHES AND SWITCH-STANDS.
American Valve & Meter Co.
Cincinnati Frog & Switch Co.
Cleveland Frog & Crossing Co.
Indianapolis Switch & Frog Co.
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P. & M. Co., The.
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Union Switch & Signal Co.
Weir Frog Co.
Western Electric Co.
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TANKS.
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Kennicott Co.
Krupp (Prosser & Son).
National Tube Co.
Virginia Bridge & Iron Co.

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American Locomotive Co.

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Railroad Supply Co.

TIE RENEWERS.
P. & M. Co., The.

TIE TAMPING MACHINE.
Ingersoll-Rand Co.

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Duncan Lumber Co.
Stone, Frank B.
Wyckoff Pipe & Creosoting Co., Inc.

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Duncan Lumber Co.
Stone, Frank B.
Wyckoff Pipe & Creosoting Co., Inc.

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Carnegie Steel Co.

TIN ROOFING.
American Sheet & Tin Plate Co.
Stark Rolling Mill Co.

TIRES, STEEL.
Krupp (Prosser & Son).
Railway Steel-Spring Co.
Standard Steel Works Co.

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Niles-Bement-Pond Co.

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Cement-Gun Co.

TOOLS, MACHINISTS.
Cleveland Twist Drill Co.

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TOOLS, PORTABLE—(SEE PORTABLE TOOLS).

TOOLS, TRACK.
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Coes Wrench Co.
Kalamazoo Railway Supply Co.
Railroad Supply Co.
Zelnicker Supply Co., Walter A.

TRACING CLOTH—(SEE DRAWING MATERIALS).

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TRACK JACKS—(SEE JACKS).

TRACK TOOLS — (SEE TOOLS, TRACK).

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TRAP DOORS — (SEE DOORS, PLATFORM TRAP).

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TROLLEYS — (SEE HOISTS, ELECTRIC; HOISTS, HAND AND HORSE POWER).

TRUCK BOLSTERS — (SEE BOLSTERS, STEEL).

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TURRET LATHES — (SEE LATHES, TURRET).

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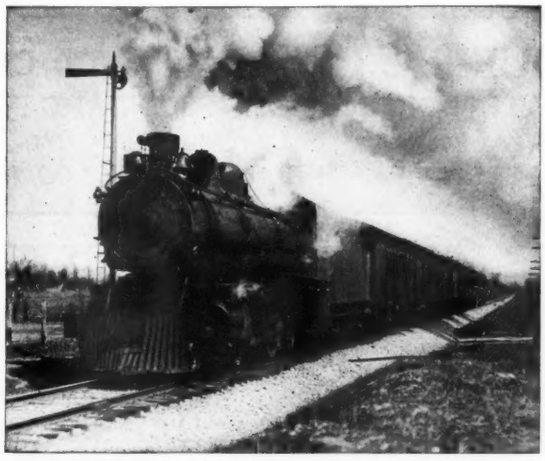

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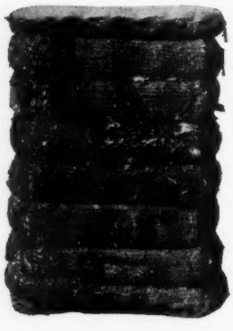

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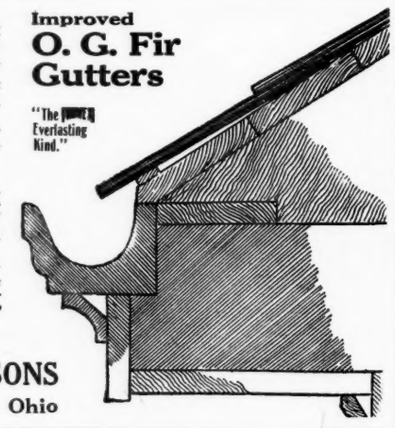

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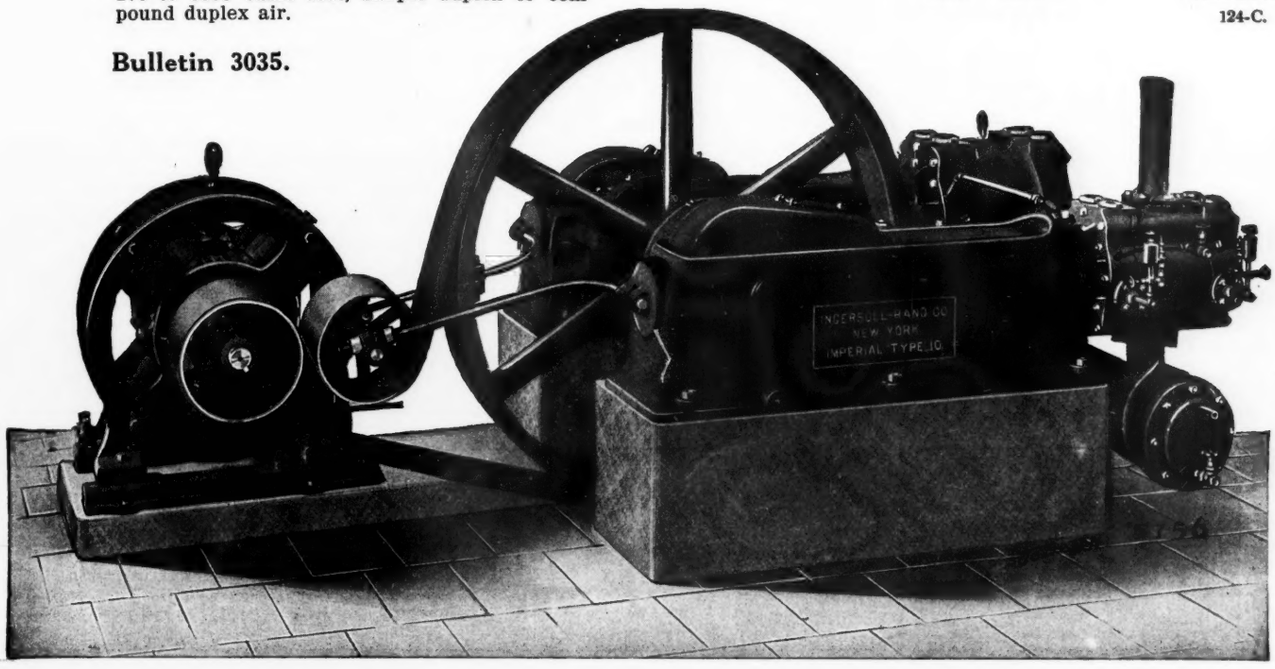

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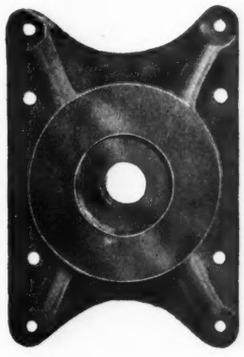

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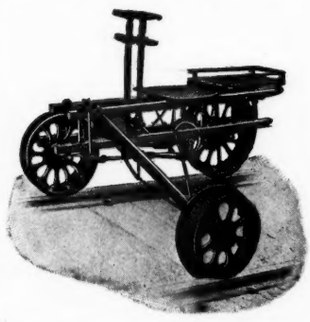

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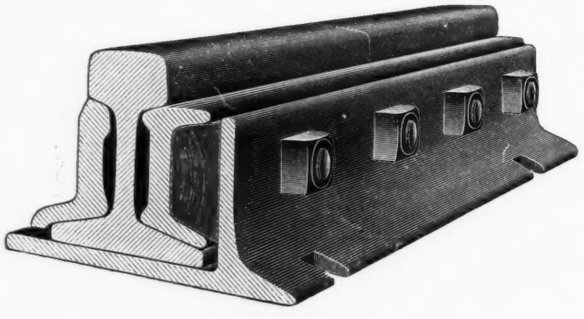

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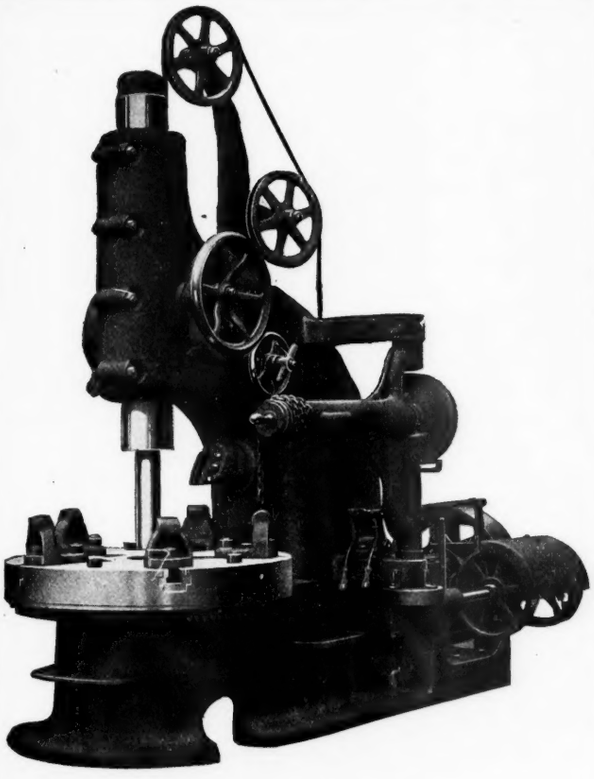

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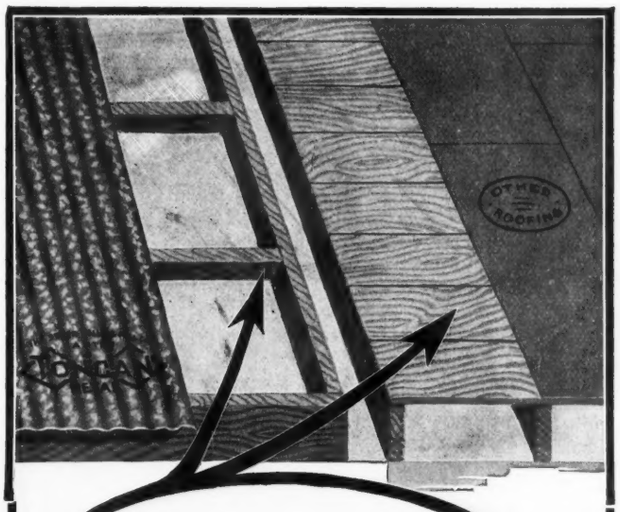

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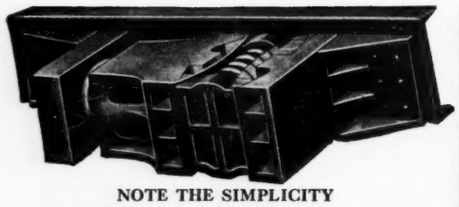

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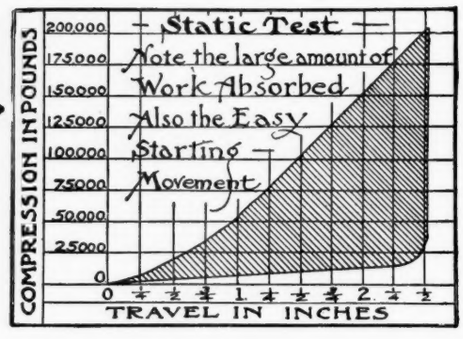

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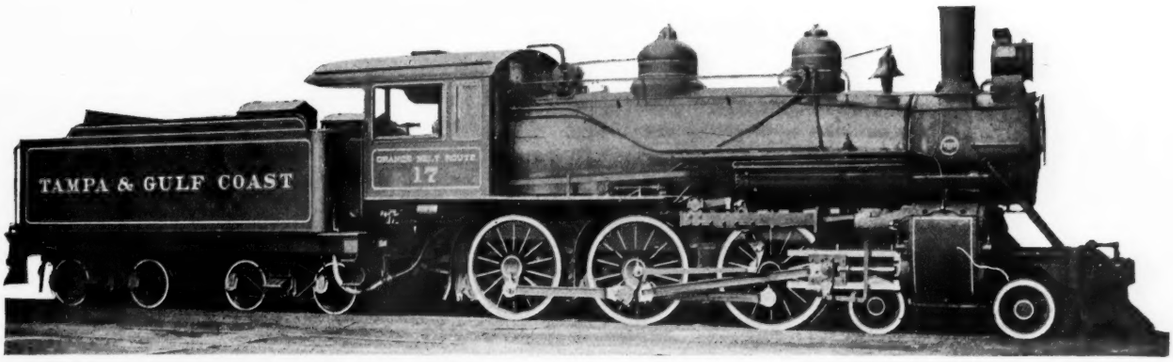
For The Tampa & Gulf Coast Railroad



The real test of railway equipment is service. Service, however, is always dependent on reliability of parts.

The above illustrated locomotive of the Tampa & Gulf Coast Railroad is equipped with "Standard" No. 1630 steel tired engine truck wheels; "Standard" steel driving tires; open hearth hammered steel driving axles; engine truck axles; connecting rods; wrist pins; frame rails; piston rods; stub straps; and steel and malleable iron castings.

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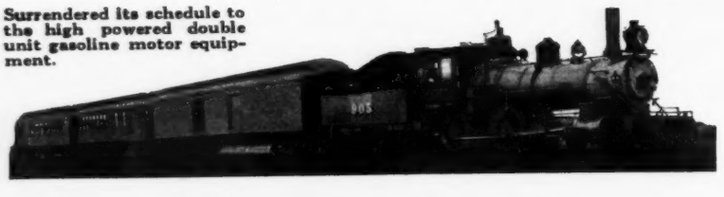

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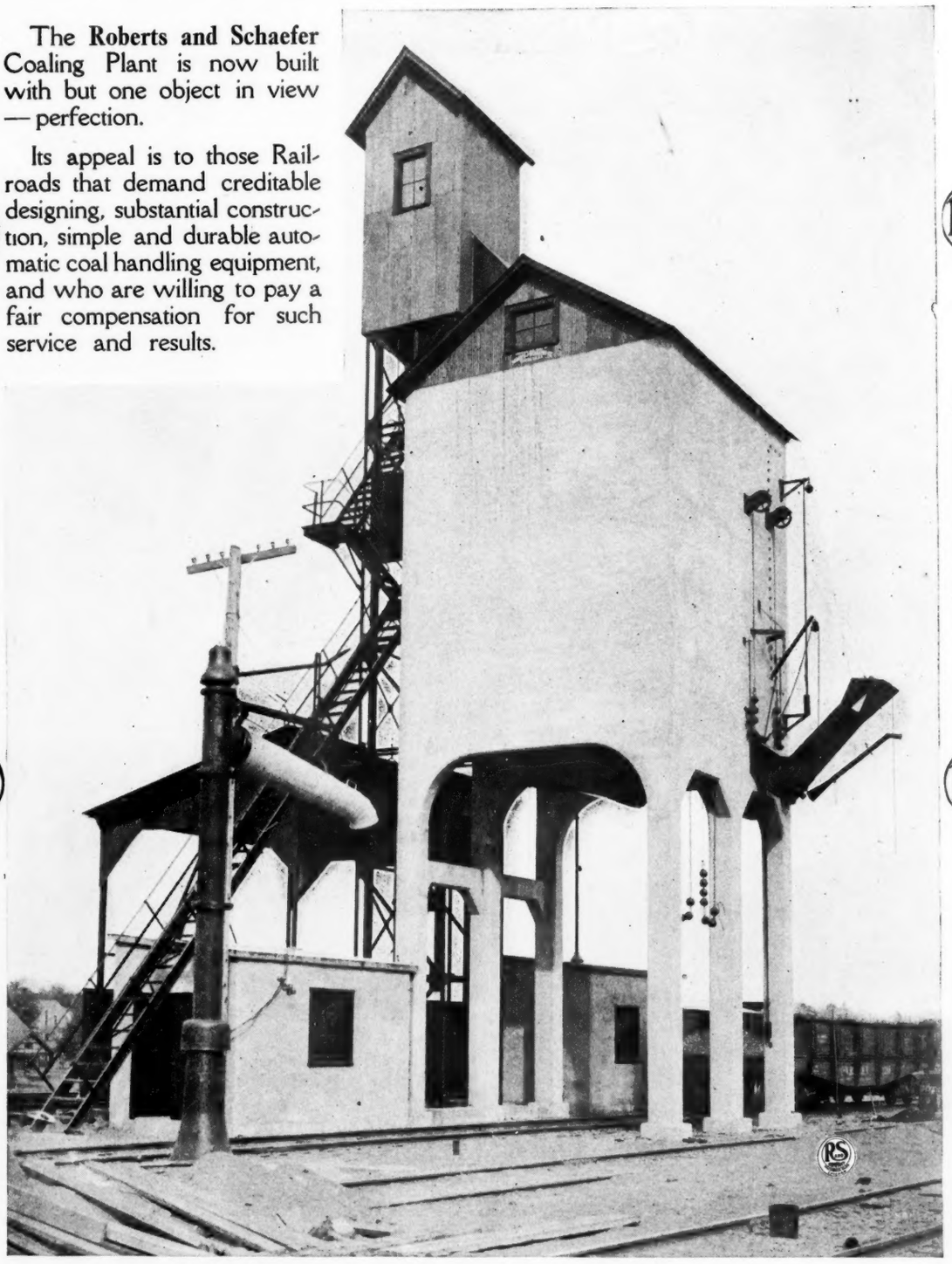

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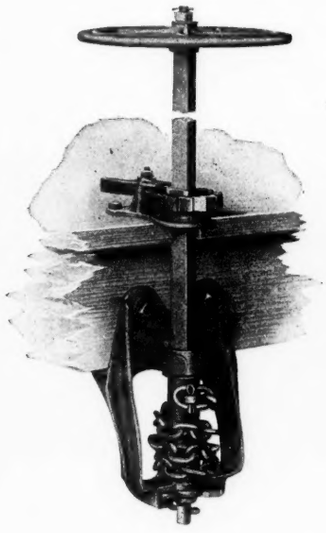

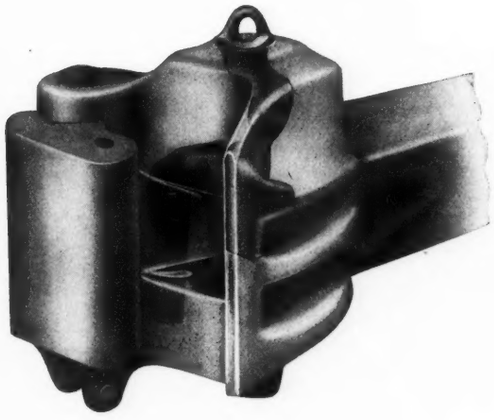

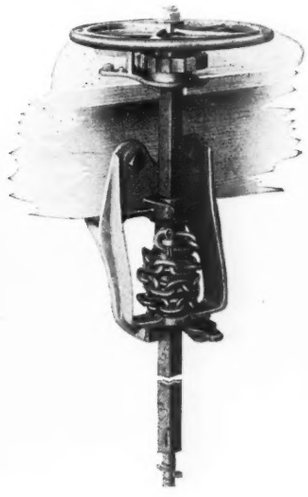

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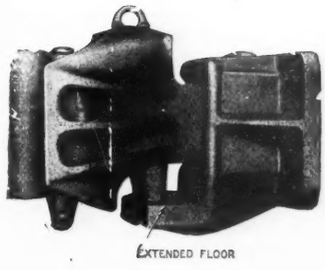

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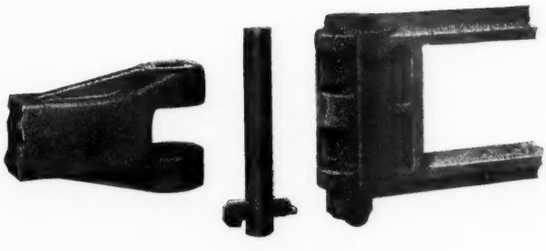

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It is to the interest of the shipper as well as of the railway that the freight arrive at destination in good condition. However, if the shipper's attention is not called to defects in the shipments as they leave his warehouse, claims will continue to be filed and he will criticize the railway. Several papers received in the contest on the handling of l.c.l. freight emphasize the necessity of freight starting right. These papers will be published in the issue of next week. They call attention to the benefits to be derived by mutual co-operation between the shippers and the railways, which not only result in reducing loss and damage claims, but in increasing business as well, for the interest shown by a railway in shipments of its patrons is a definite aid in traffic solicitation.

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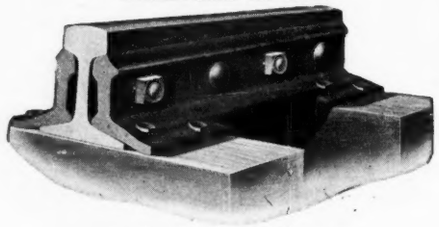
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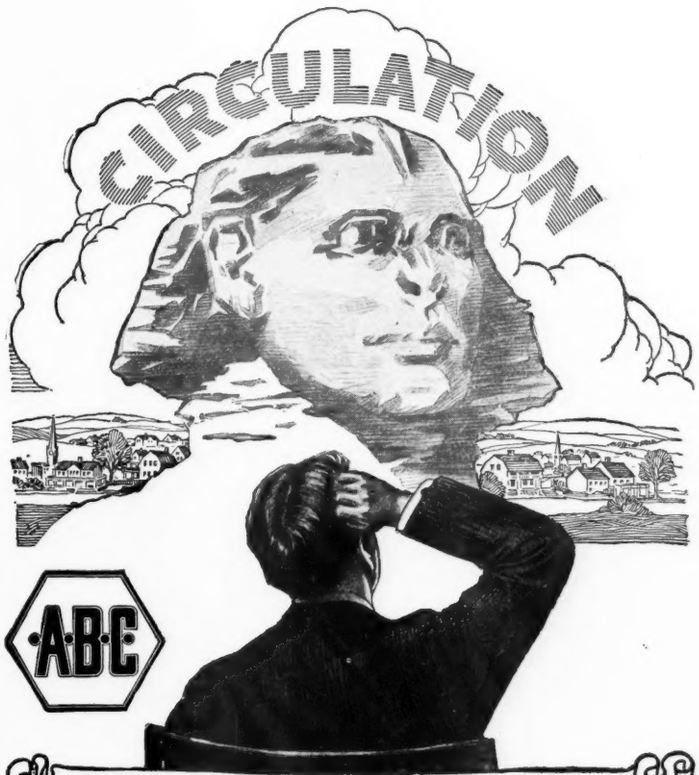

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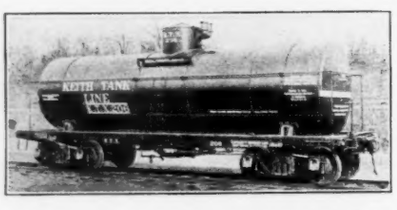

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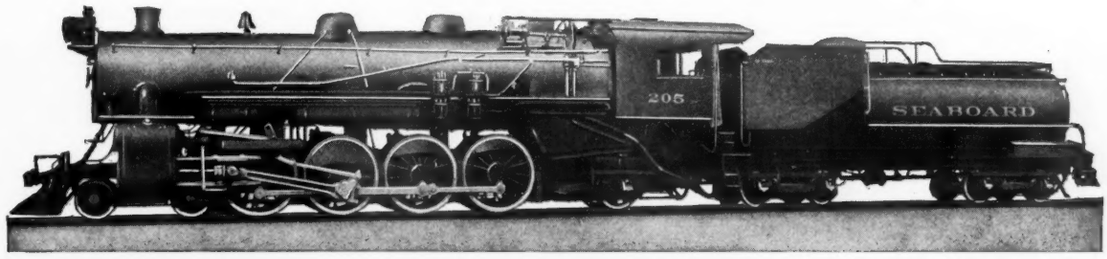


MOUNTAIN TYPE LOCOMOTIVE—SEABOARD AIR LINE.

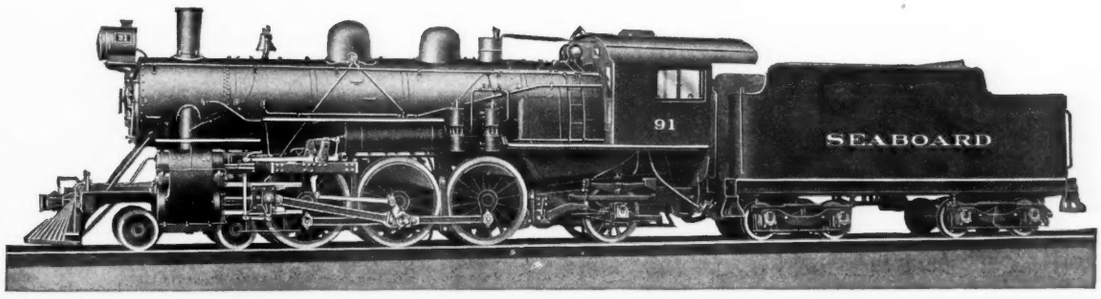
Total Weight of Engine, 316,000 pounds; Weight on Drivers, 210,500 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 190 pounds; Cylinders, 27 x 28 inches; Maximum Tractive Power, 47,800 pounds.

A saving of 17.3 per cent in coal per ton mile is being made on the Seaboard Air Line by substituting Mountain type locomotives for Pacifics in difficult passenger service.

The Mountain type locomotives consume 0.148 pounds of coal per ton mile with 10 all steel cars, and the Pacifics 0.179 pounds of coal per ton mile with 7 wood and steel cars.

The average speed over the division with both classes of engines is the same. There are several 1.25 per cent grades 3½ miles long.

Our engineers are available for co-operation with you to investigate the adaptability of Mountain type locomotives for your conditions.



PACIFIC TYPE LOCOMOTIVE—SEABOARD AIR LINE

Total Weight of Engine, 223,000 pounds; Weight on Drivers, 141,500 pounds; Diameter of Drivers, 72 inches; Boiler Pressure, 195 pounds; Cylinders, 23 x 28 inches; Maximum Tractive Power, 32,800 pounds.

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"Every man we've got is an expert in his line.
I can't find any better in this country or abroad.
All but one are experienced railroad men.
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Your combustion, firebox and drafting problems.
Make use of your opportunity!
They just naturally like to work for you
To help you make a record."

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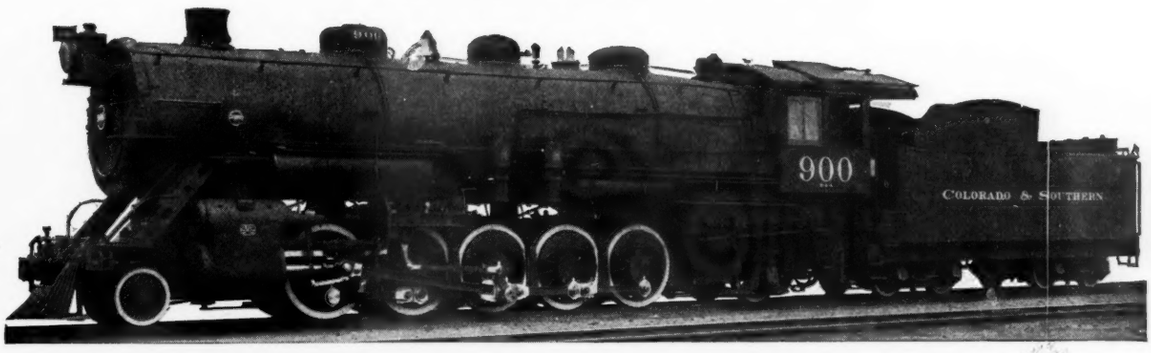
THE 2-10-2 TYPE

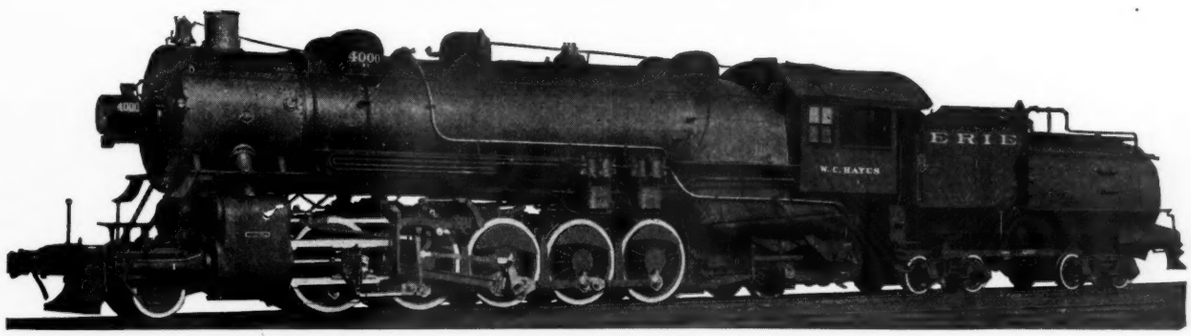


2-10-2 Type Locomotive, Chicago, Burlington & Quincy R. R. Co.
F. A. Torrey, General Supt. Motive Power. C. B. Young, Mechanical Engineer.

CYLINDERS—30 x 32 inches.
DRIVING-WHEELS, DIAM.—60 inches.
STEAM PRESSURE—175 lbs.
GRATE AREA—88 sq. ft.
WATER HEATING SURFACE—5,349 sq. ft.
SUPERHEATING SURFACE—1,232 sq. ft.
WEIGHT ON DRIVING-WHEELS—295,950 lbs.
WEIGHT, TOTAL ENGINE—367,850 lbs.
TRACTIVE FORCE—71,500 lbs.

The 2-10-2 type is a direct development of the Mikado (2-8-2) type. With equal loads per pair of driving wheels, it can exert 25 per cent. greater tractive force than the 2-8-2; while it has equally high steaming capacity in proportion to adhesion. It is typically a road engine specially fitted for heavy freight traffic on steep grades.

The advantages of the 2-10-2 type should be carefully studied before selecting new power for difficult service.



2-10-2 Type Locomotive, Erie R. R. Co.
Wm. Schlafge, General Mechanical Superintendent.

CYLINDERS—31 x 32 inches.
DRIVING-WHEELS, DIAM.—63 inches.
STEAM PRESSURE—200 lbs.
GRATE AREA—88.1 sq. ft.
WATER HEATING SURFACE—5,801 sq. ft.
SUPERHEATING SURFACE—1,377 sq. ft.
WEIGHT ON DRIVING WHEELS—327,250 lbs.
WEIGHT, TOTAL ENGINE—407,700 lbs.
TRACTIVE FORCE—83,000 lbs.

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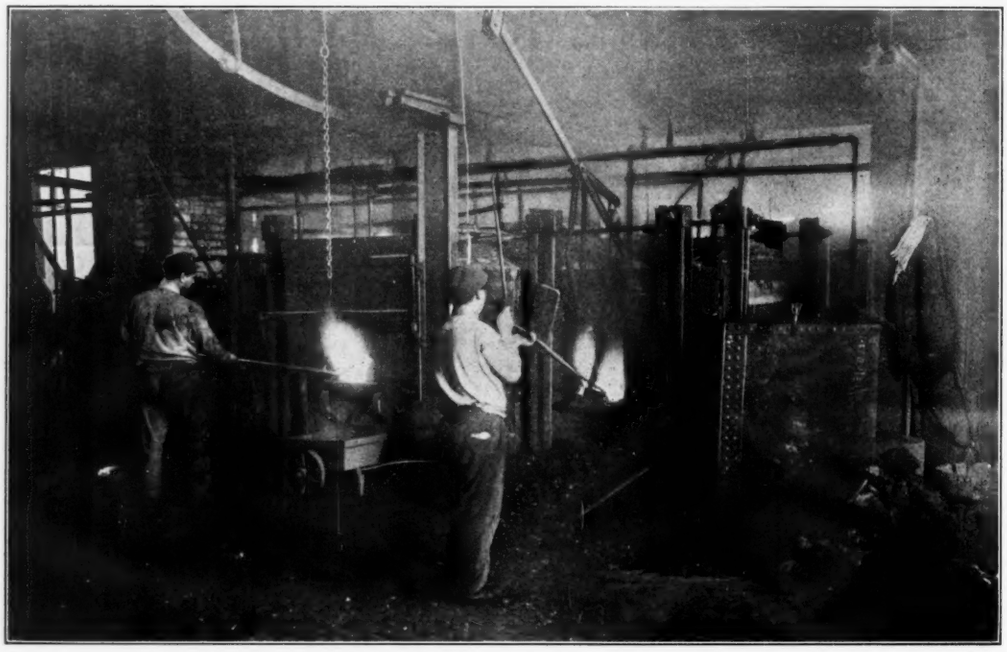

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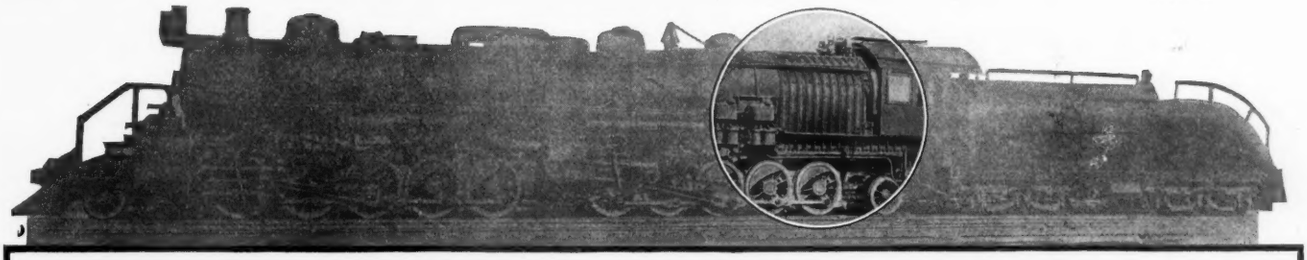

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The Jacobs-Shupert Firebox is the result of this insistent demand for dependability and safety in motive power—it's the outgrowth of the desire for better transportation and greater economies in maintenance. The strength and strain-resisting properties of the Jacobs-Shupert Firebox make for low maintenance and freedom from break-down in service. In short, the Jacobs-Shupert Firebox is the strong dependable link between the shovel and the stack.

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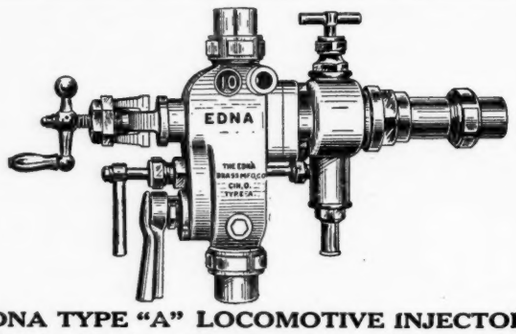

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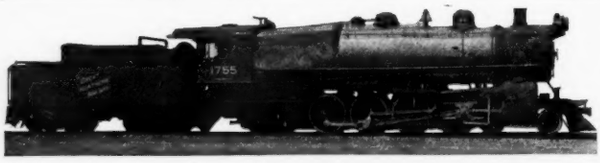
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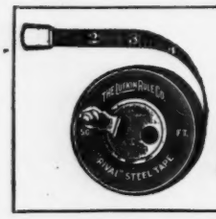

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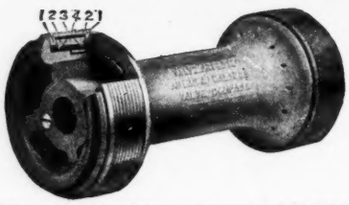

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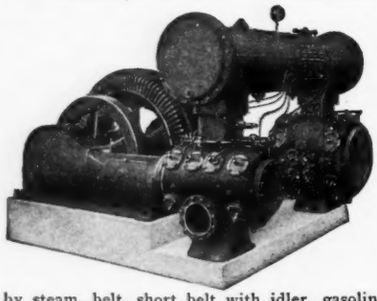

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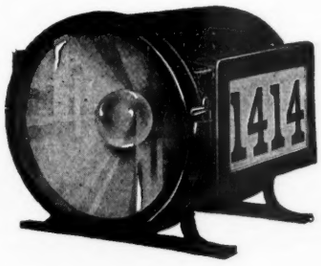

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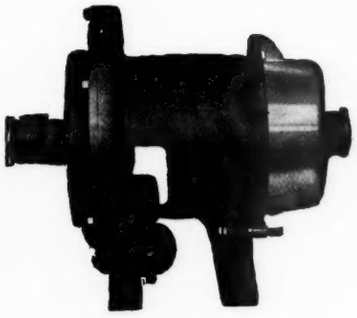
Capacity, 150 watts; 6 volts; speed, 2400 R.P.M.; weight, 120 lbs. Suitable for all types of locomotives where the maximum lights do not exceed 150 watts. Meets all the requirements recommended by Am. M. M. Association.



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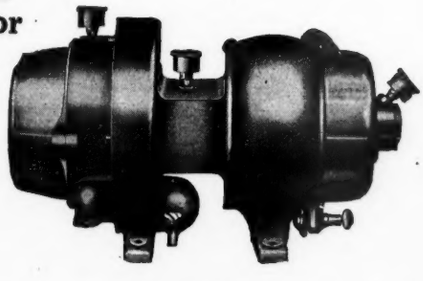

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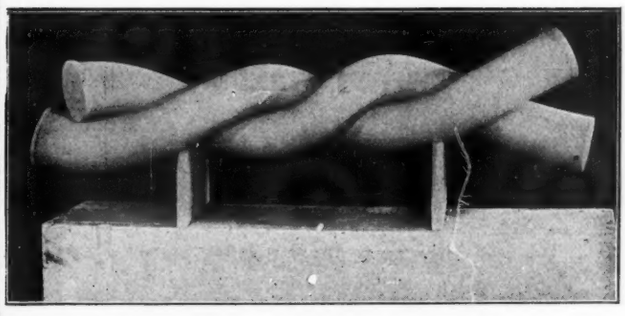

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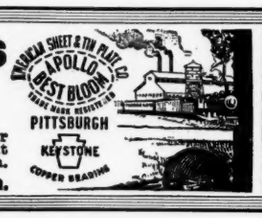

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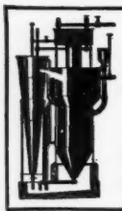

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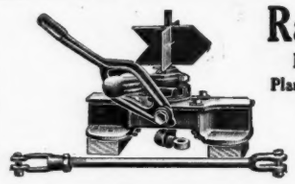

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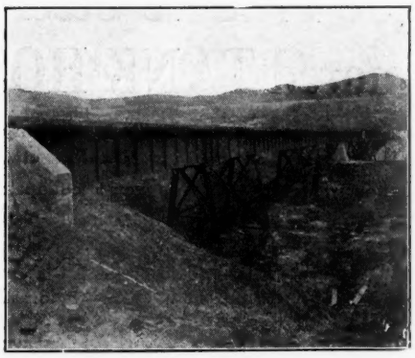

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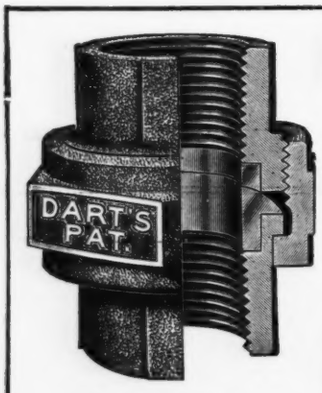

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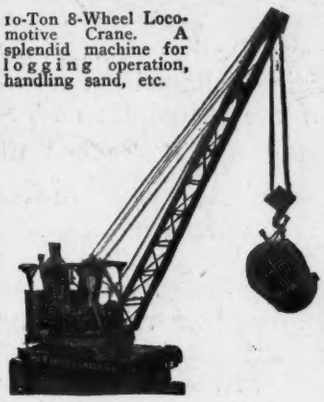

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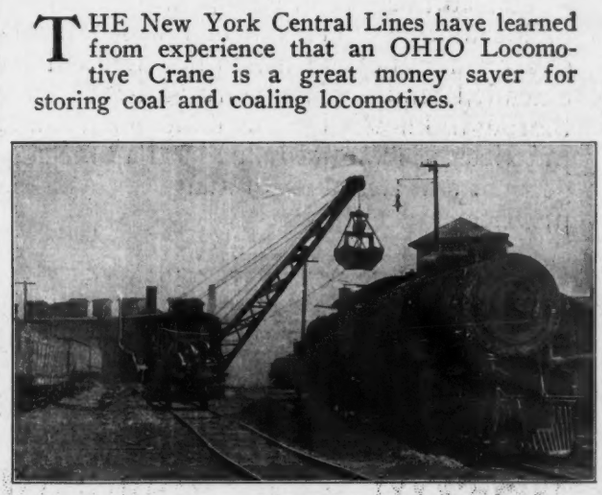

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